The Lucidity Institute

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How to remember your dreams

Remembering your dreams is the starting place for learning to have lucid dreams. If you don't recall your dreams, even if you do have a lucid dream, you won't remember it! And, in order to be able to recognize your dreams as dreams while they are happening, you have to be familiar with the way your own dreams work. Before it will be worth your time to work on lucid dream induction methods, you should be able to recall at least one dream every night.

Getting plenty of sleep is the first step to good dream recall. If you are rested it will be easier to focus on your goal of recalling dreams, and you won't mind so much taking the time during the night to record your dreams. Another benefit of getting plenty of sleep is that dream periods get longer and closer together as the night proceeds. The first dream of the night is the shortest, perhaps 10 minutes in length, while after 8 hours of sleep, dream periods can be 45 minutes to an hour long. We all dream every night, about one dream period every 90 minutes. People who say they never dream simply never remember their dreams. You may have more than one dream during a REM (dream) period, separated by short arousals that are most often forgotten. It is generally accepted among sleep researchers that dreams are not recalled unless the sleeper awakens directly from the dream, rather than after going on to other stages of sleep.

It can be useful while you are developing your dream recall to keep a complete dream journal. Keep the journal handy by your bed and record every dream you remember, no matter how fragmentary. Start by writing down all your dreams, not just the complete, coherent, or interesting ones--even if all you remember is a face or a room, write it down.

When you awaken in the night and recall what you were dreaming, record the dream right away. If you don't, in the morning you may find you remember nothing about the dream, and you will certainly have forgotten many interesting details. We seem to have built-in dream erasers in our minds, which make dream experiences more difficult to recall than waking ones. So, whenever you remember a dream, write it down. If you don't feel like writing out a long dream story at 3 AM, note down key points of the plot. Also write down the precise content of any dialogue from the dream, because words will almost inevitably be forgotten in a very short time.

Possibly, all you will need to do to increase your dream recall is to remind yourself as you are falling asleep that you wish to awaken fully from your dreams and remember them. This works in a similar manner to remembering to awaken at a certain time in the morning. Additionally, it may help to tell yourself you will have interesting, meaningful dreams. A major cause of dream forgetting is interference from other thoughts competing for your attention. Therefore, let your first thought upon awakening be, "What was I just dreaming?" Before attempting to write down the dream, go over the dream in your mind, re-telling the dream story to yourself. DO NOT MOVE from the position in which you awaken, and do not think of the day's concerns. Cling to any clues of what you might have been experiencing--moods, feelings, fragments of images, and try to rebuild a story from them. When you recall a scene, try to recall what happened before that, and before that, reliving the dream in reverse. If after a few minutes, all you remember is a mood, describe it in a journal. If you can recall nothing, try imagining a dream you might have had--note your present feelings, list your current concerns to yourself, and ask yourself, "Did I dream about that?" Even if you can't recall anything in bed, events or scenes of the day may remind you of something you dreamed the night before. Be ready to notice this when it happens, and record whatever you remember.

If you find that you sleep too deeply to awaken from your dreams, try setting an alarm clock to wake you at a time when you are likely to be dreaming. Since our REM periods occur at approximately 90 minute intervals, good times will be multiples of 90 minutes after you go to sleep. Aim for the later REM periods by setting the alarm to go off at 4.5, 6, or 7.5 hours after you go to sleep. Once again, when you wake up, don't move and think first of what you were just dreaming before writing.

To remind yourself of your intentions and get yourself into the spirit of your dreams, read through your dream journal at bedtime. Learning to remember your dreams may seem difficult at first, but if you persist, you will almost certainly succeed--and may find yourself remembering four or more dreams per night. Of course, once you reach this level, you probably won't want to write them all down--just the significant or compelling ones. And, the more familiar you become with the style of your own dreams, the easier it will be to remember you are dreaming while you are dreaming--and explore the world of your dreams while still on the scene.

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Other Worlds: Out-of-Body experiences and lucid dreams

by Lynne Levitan and Stephen LaBerge, Ph.D.

"Out of body" experiences (OBEs) are personal experiences during which people feel as if they are perceiving the physical world from a location outside of their physical bodies. At least 5 and perhaps as many as 35 of every 100 people have had an OBE at least once in their lives (Blackmore, 1982). OBEs are highly arousing; they can be either deeply disturbing or profoundly moving. Understanding the nature of this widespread and potent experience would no doubt help us better understand the experience of being alive and human.

The simplest explanation is that OBEs are exactly what they seem: the human consciousness separating from the human body and traveling in a discorporate form in the physical world. Another idea is that they are hallucinations, but this requires an explanation of why so many people have the same delusion. Some of our experiments have led us to consider the OBE as a natural phenomenon arising out of normal brain processes. Thus, we believe that the OBE is a mental event that happens to healthy people. In support of this, psychologists Gabbard and Twemlow (1984) have concluded from surveys and psychological tests that the typical OBE experient is "a close approximation of the 'average healthy American.'" (p. 40)

Our conception, also proposed by the English psychologist Susan Blackmore, is that an OBE begins when a person loses contact with sensory input from the body while remaining conscious (Blackmore, 1988; LaBerge - Lucidity Letter; Levitan - Lucidity Letter). The person retains the feeling of having a body, but that feeling is no longer derived from data provided by the senses. The "out-of-body" person also perceives a world that resembles the world he or she generally inhabits while awake, but this perception does not come from the senses either. The vivid body and world of the OBE is made possible by our brain's marvelous ability to create fully convincing images of the world, even in the absence of sensory information. This process is witnessed by each of us every night in our dreams. Indeed, all dreams could be called OBEs in that in them we experience events and places quite apart from the real location and activity of our bodies.

WHAT ARE OBES LIKE?

So, we are saying that OBEs may be a kind of dream. But, even so, they are extraordinary experiences. The great majority of people who have had OBEs say they are more real than dreams. Common aspects of the experience include being in an "out-of-body" body much like the physical one, feeling a sense of energy, feeling vibrations, and hearing strange loud noises (Gabbard & Twemlow, 1984). Sometimes a sensation of bodily paralysis precedes the OBE (Salley, 1982; Irwin, 1988; Muldoon & Carrington, 1974; Fox, 1962).

To the sleep researcher, these strange phenomena are remarkably reminiscent of another curious experience, called sleep paralysis. Sleep paralysis occurs sometimes when a person is waking from or falling into REM sleep, the state in which most vivid dreams occur. During REM sleep, the muscles of the body, excluding the eye muscles and those responsible for circulation and respiration, are immobilized by orders from a nerve center in the lower brain. This prevents us from acting out

our dreams. Occasionally, this paralysis turns on or remains active while the person's mind is fully awake and aware of the world.

Some of the experiences people have reported during sleep paralysis are: "I feel completely removed from myself," "feeling of being separated from my body," "eerie, rushing experiences," and hearing "hissing in the ears," and "roaring in the head." These events appear to be much like the OBE sensations of vibrations, strange noises, and drifting away from the physical body (Everett, 1983). Fear has also been described as a common component of sleep paralysis (see the "Question and Answer" in NightLight, Vol. 2, No. 1 for a discussion of overcoming fear in sleep paralysis.)

WHEN DO OBES HAPPEN?

So, it seems possible that at least some OBEs arise from the same conditions as sleep paralysis, and that these two terms may actually be naming two aspects of the same phenomenon. As a first test of this idea, we should ask how many OBEs actually occur at times when people are likely to experience sleep paralysis -- that is, do OBEs happen when people are lying down, asleep, resting, or while awake and active?

Researchers have approached the question of the timing of OBEs by asking people who claim to have had OBEs to describe when they happened. In one of these, over 85 percent of those surveyed said they had had OBEs while they were resting, sleeping or dreaming. (Blackmore, 1984) Other surveys also show that the majority of OBEs occur when people are in bed, ill, or resting, with a smaller percentage coming while the person is drugged or medicated. (Green, 1968; Poynton, 1975; Blackmore, 1983)

Survey evidence favors the theory that OBEs could arise out of the same conditions as sleep paralysis. There is also considerable evidence that people who tend to have OBEs also tend to have lucid dreams, flying and falling dreams, and the ability to control their dreams (Blackmore, 1983, 1984; Glicksohn, 1989; Irwin, 1988).

Because of the strong connection between OBEs and lucid dreaming, some researchers in the area have suggested that OBEs are a type of lucid dream (Faraday, 1976; Honegger, 1979; Salley, 1982). One problem with this argument is that although people who have OBEs are also likely to have lucid dreams, OBEs are far less frequent, and can happen to people who have never had lucid dreams. Furthermore, OBEs are quite plainly different from lucid dreams in that during a typical OBE the experient is convinced that the OBE is a real event happening in the physical world and not a dream, unlike a lucid dream, in which by definition the dreamer is certain that the event is a dream. There is an exception that connects the two experiences -- when we feel ourselves leaving the body, but also know that we are dreaming.

In our studies of the physiology of the initiation of lucidity in the dream state, we observed that quite of few of the lucid dreams we collected contained experiences like OBEs. The dreamers described lying in bed, feeling strange bodily sensations, often vibrations, hearing loud humming noises, and then rising out of body and floating above the bed. Those studies revealed that lucid dreams have two ways of starting. In the much more common variety, the "dream-initiated lucid dream" (DILD), the dreamer acquires awareness of being in a dream while fully involved in it. DILDs occur when dreamers are right in the middle of REM sleep, showing lots of the characteristic rapid eye movements. We know this is true because our dreamers give a deliberate prearranged eye-movement signal when they realize they are dreaming. These signals show up on our physiology record, so that we can pinpoint the times when lucidity begins and see what kind of brain state

the dreamers were in at those times. DILDs account for about four out of every five lucid dreams that our dreamers have had in the laboratory. In the other 20 percent, the dreamers report awakening from a dream and then returning to the dream state with unbroken awareness -- one moment they are aware that they are awake in bed in the sleep laboratory, and the next moment, they are aware that they have entered a dream and are no longer perceiving the room around them. We call these "wake initiated lucid dreams" (WILDs).

A casual look at the dream reports and physiological records led us to think that the OBE-type dream content was happening mostly in WILDs. So, we analyzed the data scientifically in the experiment described below.

THE LABORATORY STUDY

The data we studied consisted of 107 lucid dreams from a total of 14 different people. The physiological information that we collected in conjunction with each lucid dream always included brain waves, eye-movements, and chin muscle activity. These measurements are necessary for determining if a person in awake, asleep, and in REM sleep or not. In all cases, the dreamer signaled the beginning of the lucid dream by making a distinct pattern of eye movements that was identifiable by someone not involved with the experiment.

After verifying that all the lucid dreams had eye signals showing that they had happened in REM sleep, we classified them into DILDs and WILDs, based on how long the dreamers had been in REM sleep without awakening before becoming lucid (two minutes or more for DILDs, less that two minutes for WILDs), and on their report of either having realized they were dreaming while involved in a dream (DILD) or having entered the dream directly from waking while retaining lucidity (WILD).

Alongside the physiological analysis we scored each dream report for the presence of various events that are typical of OBEs, such as feelings of body distortion (including paralysis and vibrations), floating or flying, references to being aware of being in bed, being asleep or lying down, and the sensation of leaving the body (for instance, "I was floating out-of-body").

RESULTS: MORE OBE-LIKE EVENTS IN WILDS

Ten of the 107 lucid dreams qualified as OBEs, because the dreamers reported feeling like they had left their bodies in the dream. Twenty of the lucid dreams were WILDs, and 87 were DILDs. Five of the OBEs were WILDs (28%) and five were DILDs (6%). Thus, OBEs were more than four times more likely in WILDs than in DILDs.

The three OBE-related events we looked for also all occurred more often in WILDs than in DILDs. Almost one third of WILDs contained body distortions, and over a half of them included floating or flying or awareness of being in bed. This is in comparison to DILDs, of which less than one fifth involved body distortions, only one third included floating or flying, and one fifth contained awareness of bed.

The reports from the five DILDs that we classified as OBEs were actually much like those from the WILD-OBEs. In both the dreamers felt themselves lying in bed and experiencing strange sensations including paralysis and floating out-of-body. Although these lucid dreams sound like WILDs, we had classified them as DILDS because the physiological records showed no awakenings preceding lucid-

ity. However, it is possible that these people could have momentarily become aware of their environments (and hence been "awake") while continuing to show the brainwaves normally associated with REM sleep. The science of the EEG is not sufficiently advanced that we can tell what people are experiencing by looking at their brainwaves. Anecdotes from dream reports indicate that people sometimes become aware of sensations from their sleeping bodies while dreaming -- for example, the dream in which you are trying to run while your legs become heavier and heavier, perhaps because you are feeling their true immobile condition.

OBES AND WILDS OUTSIDE THE LABORATORY

Our laboratory studies showed us that when OBEs happen in lucid dreams they happen either when a person reenters REM sleep right after an awakening, or right after having become aware of being in bed. However, we wondered if this relationship would apply to OBEs and lucid dreams that people experience at home, in the "real world."

Not being able to take the sleep lab to the homes of hundreds of people (the DreamLight may soon give us this capacity!), we took a survey about OBEs and other dream-related experiences, somewhat like the past studies referred to earlier. The difference between our survey and previous ones is that in addition to asking if people had had OBEs, we asked specifically about certain events that we know to be associated with WILDs, namely, lucid dreaming, returning directly to a dream after awakening from it, and sleep paralysis.

A total of 572 people filled out our questionnaire. They were either students in an introductory psychology course or readers of the NightLight. About a third of the group reported having had at least one OBE. Just over 80 percent had had lucid dreams. Sleep paralysis was reported by 37 percent and 85 percent had been able to return to t a dream after awakening.

People who reported more dream-related experiences also reported more OBEs. For example, of the 452 people claiming to have had lucid dreams, 39 percent also reported OBEs, whereas only 15 percent of those who did not claim lucid dreams said they had had OBEs. The group with the most people reporting OBEs (51%) were those who said they had experienced lucid dreams, dream return, and sleep paralysis.

We would expect people who can return directly to dreams after an awakening to be prone to having WILDs, and therefore also to have frequent lucid dreams. Indeed, in this survey, people reporting frequent dream return also tended to report frequent lucid dreams. Thus, we believe that the fact that dream return frequency was linked with OBE frequency in this study gives further support to our laboratory research finding that WILDs were associated with OBEs.

WHAT DO WE KNOW NOW?

Our two studies have compared the frequency of OBEs in the two types of lucid dream, and surveyed the relative frequency of OBEs and dream-related events in a large number of people. We have thereby learned that when OBEs happen during lucid dreams, they generally happen in lucid dreams that arise from brief awakenings in REM sleep, and that people who have certain special dream experiences are more likely to have OBEs that people who do not. These dream experiences include returning to the dream state after an awakening, lucid dreaming and sleep paralysis.

Above we described our operating theory that OBEs occur when people lose input from their sense organs, as happens at the onset of sleep, while retaining consciousness. This combination of events is especially likely when a person passes directly from waking into REM sleep. In both states the mind is alert and active, but in waking it is processing sensory input from the outside world, while in dreaming it is creating a mental model independent of sensory input. This model includes a body. When dreaming, we generally experience ourselves in a body much like the "real" one, because that is what we are used to. However, our internal senses in the physical body, which when we are awake inform us about our position in space and the movement of our limbs. This information is cut off in REM sleep. Therefore, we can dream of doing all kinds of things with our dream bodies -- flying, dancing, running from monsters, being dismembered -- all while our physical bodies lie safely in bed.

During a WILD, or sleep paralysis, the awake and alert mind keeps up its good work of showing us the world it expects is out there -- although it can no longer sense it. So, then we are in a mentalÐdreamÐworld. Possibly we feel the cessation of the sensation of gravity as that part of sensory input shuts down, and then feel that we are suddenly lighter and float up, rising from the place where we know our real body to be lying still. The room around us looks about the same, because that is our brain's best guess about where we are. If we did not know that we had just fallen asleep, we might well think that we were awake, still in touch with the physical world, and that something mighty strange was happening -- a departure of the mind from the physical body!

The unusual feeling of leaving the body is exciting and alarming. This, combined with the realistic imagery of the bedroom is enough to account for the conviction of many OBE experients' that "it was too real to be a dream." Dreams, too, can be astonishingly real, especially if you are attending to their realness. Usually, we pass through our dreams without thinking much about them, and upon awakening remember little of them. Hence, they seem "unreal." But waking life is also like that -- our memory for a typical, mundane day is flat and lacking in detail. It is only the novel, exciting, or frightening events that leave vivid impressions. If we stop what we are doing, we can look around and say, "Yes, this world looks solid and real." But, if you look back and try to recall, for instance, brushing your teeth this morning, your memory is likely to be vague and not very life-like. Contrast this to a past event that excited or alarmed you, which is likely to seem much more "real" in retrospect.

Lucid dreamers often comment to themselves in dreams, "I know this is a dream, but it all seems so incredibly real!" All this goes to show that the feeling that an event is real does not mean that it is happening in the physical world that we all share when we are awake. This is not to deny that that inner experiences are real, in that they have deeply profound effects on our lives. However, as lucid dreaming so amply demonstrates, we can learn to distinguish between our personal dreams and events in the consensus dream we call physical reality. When we do, we find that what we thought was one thing -- the waking world -- is actually another -- a dream.

Proof that some or even most OBEs are dreams is not enough to allow us to say that a genuine OBE is impossible. However, in the interests of lucidity, if you have an OBE, why not test to see if the OBE-world passes the reality test? Is the room you are in the one you are actually sleeping in? If you have left your body, where is it? Do things change when you are not looking at them (or when you are)? Can you read something twice and have it remain the same on both readings? If any of your questions and investigations leave you doubting that you are in the physical world, is it not logical to believe you are dreaming?

Another point to consider is that a dream doesn't always have to happen in REM sleep. Most do, but there are probably quite a few other conditions in which people can lose touch with sensory experience and enter a mental world. Some such states that we know of are hypnotic trance, anesthesia, and sensory isolation. OBEs have been reported from these states (Nash et al., 1984; Olson, 1988). Thus, the argument that an OBE cannot be a dream because the experient wasn't asleep doesn't hold water.

THE "IN-THE-BODY" EXPERIENCE

To end this discussion of the origins of the OBE, an event considered unbelievable by many and metaphysical by others, let's consider the state of affairs that is considered normal: the "in-the-body" experience. What does it mean to be in a body? Saying that one is in a body implies that the self is an object with definite borders capable of being contained by the boundaries of another object -- the physical body. However, we do not have any evidence that the self is such a concrete thing. What we think of as "out-of-body" in an OBE is the experience of the self. This experience of being "in" a body is normally based on perceptual input from the senses of both the world external to the body and the processes within the body. These give us a sense of localization of the self in space. However, it is the body, and its sense organs, that occupy a specific locus, not the self. The self is not the body or the brain. If we think that the self is a product of brain function, even this does not make it reasonable to state that the self is in the brain -- is the meaning contained in these words in this page? It may not make any sense on an objective level to say that the self is anywhere. Rather, the self is where it feels itself to be. Its location is purely subjective and derived from input from the sensory organs.

Putting aside the question of the essential nature of the self, perception is undeniably a phenomenon tied to brain function. So, when we find ourselves experiencing a world that seems much like the one we are used to perceiving with our usual equipment -- eyes, ears, etc., all things linked to our brains, it would be logical to assume that it is our usual brain creating the experience. And, if we were to really leave our bodies -- severing all connection with them -- it would be illogical to assume that we would see the world in the same way. Therefore, although no amount of contradictory evidence can rule out the possibility of a real "out of body experience," in which an individual exists in some form entirely independent of the body, it is highly unlikely that such a form would utilize perceptual systems identical to those of the physical human form.

Spiritual teachings tell us that we have a reality beyond that of this world. The OBE may not be, as it is easily interpreted, a literal separation of the soul from the crude physical body, but it is an indication of the vastness of the potential that lies wholly within our minds. The worlds we create in dreams and OBEs are as real as this one, and yet hold infinitely more variety. How much more exhilarating to be "out-of-body" in a world where the only limit is the imagination than to be in the physical world in a powerless body of ether! Freed of the constraints imposed by physical life, expanded by awareness that limits can be transcended, who knows what we could be, or become?

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Note: References below are to the issues of NightLight (NL) in which the experiment (X) and the update (U) appeared.

A Thousand and One Nights of Exploring Lucid Dreaming

By Lynne Levitan

The NightLight experiments have brought forth important knowledge about lucid dreaming. An overview of the research to date may help provide a gestalt of current understanding of the lucid dream state and stimulate further inquiry.

1. INDUCING LUCID DREAMS [X: NL 1(1); U: NL 1(3)]

The first experiment, published in the first issue of NightLight, cut straight to the core of our questions. It was an examination of the effectiveness of a few lucid dream induction techniques that we had reason to believe were helpful. Subjects collected information on their lucid dream frequencies during four conditions. In the first, they practiced no induction techniques. In the second, they used a form of auto-suggestion. Before bed, they wrote on a piece of paper, "Tonight I will have a lucid dream," and signed the paper. This condition was intended as sort of control, in which people were attempting to have lucid dreams but with a technique that we did not believe to be effective. The third condition involved Reality Testing, asking several times a day, "Am I dreaming," testing the answer and then visualizing what is like to be dreaming and become lucid. The technique for the fourth condition was MILD, the Mnemonic Induction of Lucid Dreams, developed by Stephen LaBerge and used by him to learn to have lucid dreams at will.

Our expectation was that Reality Testing and MILD would be more effective than no technique or auto-suggestion. The results upheld this hypothesis. The finding was clear-cut for MILD, but less so for Reality Testing, probably only because we did not have an adequate number of participants for solid determinations. Each participant tried one technique per week. While practicing Reality Testing, 29 percent of people had at least one lucid dream. In the MILD condition, 26 percent had lucid dreams. These numbers compare favorably to the 20 percent of participants reporting lucid dreams during the "control" conditions.

Additionally, Reality Testing proved to be more effective when practiced more often during a day. The half of the group that did the most Reality Tests per day (five times or more) had twice as many lucid dreams per dream recalled (0.64) than the half of the group that did the least (two times per day or fewer).

2. DISCOVERING DREAMSIGNS [X: NL 1(2); U: NL 1(4)]

The concept of dreamsigns developed during the writing of Exploring the World of Lucid Dreaming (LaBerge & Rheingold, Ballantine, 1990), as a term to capture the character of the anomalous events common in dreams that often stimulate people to realize that they are dreaming. A definition of dreamsign is, "a peculiar event or object in a dream that can be used as an indicator that you are dreaming."

The first investigation with dreamsigns was designed to classify and catalog which peculiarities were most common, and most likely to lead to the increased reflectiveness necessary for lucidity. The preparation involved reading hundreds of lucid dreams and selecting the events that preceded or precipitated lucidity. This myriad of oddities formed twenty preliminary groupings. The experiment asked participants to collect their own dreamsigns, categorize them according to the preliminary groupings, and rate them on a scale indicating how much the dreamer had wondered about the dreamsign. They also noted any occasions of lucidity.

From 44 people, we collected 227 dreams, containing 964 dreamsigns. Many types of analysis led to a refinement of the catalog of dreamsigns, employed in a later NightLight experiment (see "Watching for Dreamsigns," below). One analysis of particular relevance sorted out the dreamsigns that were both very common in dreams, and very likely to precede lucidity. These are presented in Table 1.

Table 1. DREAMSIGN CATEGORIES

EGO...

Form	1.5%*	10**	Dreamer is in a different body than usual, or the body is distorted.
Role	2.6%	8	Dreamer is playing a role of other than his or her normal waking self.
Action	11.6%	1	Dreamer does something unlikely or impossible in waking life.
Perception	1.7%	6	Dreamer is able to see, hear, feel things in a different way than usual.
Thought	5.3%	1	Dreamer has a dreamlike thought or alters the dream events with thought.
Emotion	10.8%	3	Dreamer experiences unusually intense emotions.
Sexual	1.2%	8	Dreamer feels sexually aroused or feels sensations in the erogenous area.
Out of Body	0.2%	9	Dreamer feels sensations as if "out of body".
Body Sense	2.0%	5	Dreamer feels an unusual sensation on or in his or her body.

Paralysis	1.0%	7	Dreamer feels unable to move.

CHARACTER...

Form	5.7%	2	A dream person is different than normal, oddly formed, or strangely dressed.
Role	2.2%	8	A dream person is playing a role different than in waking life.
Action	13.7%	4	A dream person does something unlikely or impossible in waking life.
Place	6.7%	7	A dream person is in a place where he or she is unlikely to be in waking life.

OBJECT...

Form	9.1%	7	A dream thing is strangely built, or doesn't exist in waking life.
Action	4.6%	2	A dream thing does something unlikely or impossible in waking life.
Place	4.4%	7	A dream thing is in a place where it is unlikely to be in waking life.

SETTING...

Form	7.8%	3	The place where the dream occurs is oddly constructed or impossible.
Place	5.4%	10	Dream occurs in a place the dreamer is unlikely to be in waking life.
Time	2.6%	10	Dream occurs either in the past or in some projected future.

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* Percent of the total number of dreamsigns for this category.

** A ranking from 1-10 with lower numbers more frequently occurring as lucidity triggers.

3. PROLONGING LUCID DREAMS [X: NL 1(3); U: NL 2(1)]

Because one of the most common constraints of the achievement of goals in lucid dreams is their brevity, the development of a reliable technique for prolonging lucid dreams would greatly increase the benefits available from the state. This study compared the effectiveness of three types of behavior on dream length.

The experiment was based on the notion that the dreamer can predict when a dream is about to end and be followed by an awakening by noticing that the dream is "fading." This process seems to be typically characterized by loss of visual image clarity, brightness and dimensionality. However, no systematic investigations of dream fading yet exist, so the reliability and universality of this phenomenon is unknown.

The first lucid dream prolonging method was "spinning," which means twirling around in a dream, like a dancer or a dervish. LaBerge discovered and refined this technique during his doctoral dissertation work on training himself to be a frequent lucid dreamer. His experiences and those of many lucid dreams who have also tried spinning indicated that this technique could be highly effective for postponing awakening. For the experiment, participants were to wait until their lucid dream began to fade and then begin to spin around (while still feeling their dream body) until they were in a dream again or awake.

The other two methods were not suspected dream prolonging techniques. Their purpose was to provide a contrast to spinning, to demonstrate whether or not spinning was actually having an effect on dream length. One method was "going with the flow," meaning continuing, or attempting to continue, whatever action the dreamer had been engaged in when the dream began to fade. This constituted doing nothing different in the dream, and so acted as a neutral control.

The third method had actually been proposed by Dr. Paul Tholey of Germany as a technique for causing awakening from lucid dreams. This was to focus visual attention on a single point in the dream and hold it their until the dream ended. The experiment presented this behavior as another dream prolonging technique, as a way of testing the power of suggestion in the effectiveness of actions meant to prolong dreams, and as a test of the verity of Tholey's idea.

The results derived from this study were provocative, but unfortunately, inconclusive. Not enough people submitted usable data to permit a clear understanding of the information collected, especially regarding differences in frequency of awakening following each of the three conditions. It will be very interesting to repeat this experiment with a larger group of participants.

The data from the 14 who completed the tasks hinted that dreams following spinning and going with the flow were more likely to be lucid than those following focusing on a point (70% vs. 29%). One indication that spinning may be better than the other methods for prolonging dreams appears

in the finding that the average word count of dream reports from post-spinning dreams was highest (225 words), followed by going with the flow (176), and focusing on a point (151).

4. WATCHING FOR DREAMSIGNS [X: NL 1(4); U: NL 2(1)]

This experiment used the information collected in the previous "Discovering Dreamsigns" study to examine the relationship between dreamsign occurrence and lucidity. That study had permitted condensation of the larger 20 class catalog into a more concise list focusing on the characteristics of dreamsigns most relevant for stimulating lucidity. This list is composed of four categories:

* Inner Awareness: Peculiar thoughts, strange emotions, unusual sensations or altered perceptions.

* Action: The dreamer, a dream character, or an object does something unusual or impossible.

* Form: The dreamer's body or another body or object is oddly formed or changes form.

* Context: The setting or situation in a dream is anomalous.

The structure of the experiment asked people to alternate between an induction technique of visualizing becoming lucid in a remembered dream because of noticing a dreamsign and a technique of visualizing becoming lucid without focusing on a dreamsign. No indication arose that either of these techniques was more effective at causing lucid dreams. More data from more people, however, may show a difference.

The interesting result was that people were more likely to become lucid in dreams that contained many dreamsigns. The frequency of Inner Awareness and Action dreamsigns in particular correlated significantly with lucid dreaming frequency.

This finding suggests the possibility that increasing our awareness of dreamsigns might enhance our ability to notice them in our dreams, and hence our chances of becoming lucid. Lucidity Institute courses include exercises for training people to become aware of dreamsign-like events in waking, with the hopes of increasing this awareness in dreams as well. An important target of future research should be the development of effective means of teaching dreamsign awareness.

5. NAPS: THE BEST TIME FOR LUCID DREAMING [X: NL 2(2); U: NL 2(3)]

This experiment marked the beginning of a series of investigations into the timing of efforts for inducing lucid dreams. Both laboratory and home based studies of when lucid dreams happen have shown that they are not evenly distributed throughout sleep time. In full nights of sleep, lucid dreams tend to cluster towards the end of the night, becoming more likely with each REM period of the night. Furthermore, in LaBerge's data on his own lucid dream times, he noted that he was much more likely to achieve lucidity during afternoon naps than during nightly sleep.

The goal of the nap studies is to find out whether naps are generally better than nights for lucid dreaming. If so, then what factors make this true? For example, it could be that a period of wakefulness preceding the attempt to become lucid may stimulate attention on the goal and subsequent

success. On the other hand, or perhaps in addition, the condition of the brain and body at the time of day when naps are taken may be optimal for fostering lucidity.

In this study, participants maintained the same total number of hours of sleep, while shifting the last two hours of their nights' sleep to either two or four hours after rising. Thus, in the two hour condition, they were returning to bed at their usual waking time, and in the four hour condition they napped two hours after their usual waking time.

The findings were astonishing. Lucid dreams happened ten times more often in the nap periods than in the nights. Part of this result could arise from the fact that dreams are much more common in the latter hours of sleep. For example, in this study the number of dreams per hour of sleep was four times higher in the naps than the nights. However, the ratio of number of lucid dreams to number of dreams recalled was still three times higher in the nap periods than in the nights. This meant that three out of ten dreams from naps were lucid while one out of ten dreams from nights was. There was some sign that the two hour delayed nap was better for lucid dreaming than the four hour delayed nap, but the data set was too small for this finding to be conclusive.

Such strong results showed that nap-taking was worth a lot of attention as a potentially very powerful lucid dream induction technique. Therefore, napping and other investigations of time of day relationships to lucid dreaming have become a primary focus of NightLight experiments.

6. FIFTEEN MINUTES TO LUCID DREAMING [X: NL 2(1); U: NL 2(4)]

The concept tested here was whether lucid dreaming could be stimulated by brief periods of intense focusing. One of the great challenges of lucid dream induction techniques is remembering to attend to the task. The idea was that perhaps concentrating complete attention in a circumscribed period of time could provide the benefit of periods of lesser attention scattered throughout a day.

The study aimed at finding out whether the fifteen minute focusing notion had any validity. Alas, we still do not know, because participation achieved a nadir with this experiment. Although the procedure did not require that people have lucid dreams to complete it, which always limits participation to those able to induce lucid dreams, only 20 people submitted results. Perhaps it is too much to ask for someone's complete attention for fifteen entire minutes, but that would be a dire analysis of the human condition.

A glimmering of a result appeared in that focusing periods in the evening seemed to have more of an effect on chances of becoming lucid the following night than focusing periods in the morning. However to ascertain that this finding was not due to random statistical fluctuations, similar data from at least 65 more subjects would be

necessary.

Because there is little point in conducting experiments if not enough people contribute, we made a strong plea after this for more participants. We encouraged people by offering a very simple experiment, requiring almost no effort. This was "The Dream Clock" (see below).

7. BACK TO THE NAP [X: NL 2(3); U: NL 3(1)]

Continuing where the previous nap study left off, this experiment manipulated the time at which people took the last 90 minutes of their night of sleep and compared those results with what happened when people simply stayed in bed for an extra 90 minutes. One questions was: does it matter when the last 90 minutes of sleep are taken, that is are they as effective if taken at their usual time as when delayed? The other was, could it be that the high number of lucid dreams seen in a delayed nap are the result of sleeping at that time of day, instead of being related to inserting a period of wakefulness into the block of sleep time?

The three conditions were: a. get up 90 minutes early, stay awake 90 minutes, then nap for 90 minutes; b. sleep the usual amount of time, but wake up 90 minutes early and do MILD for five minutes before completing the last 90 minutes of sleep; and, c. sleep the usual amount of time, then wake up to do MILD for five minutes before sleeping an extra 90 minutes. Again, it would have been preferable to have many more participants. Nonetheless, some salient results emerged. Almost 90 percent of the lucid dreams collected occurred in the naps or the last 90 minutes of sleep, and most of these occurred in the delayed nap condition. Twice as many people had lucid dreams in the delayed nap time than in the last ninety minutes of the "normal" night of sleep (no delayed nap or prolonged sleep). These people had three times as many lucid dreams in the delayed nap than in the last 90 minutes of the normal night. Furthermore, an analysis of the number of lucid dreams happening per dream recalled showed that the delayed nap lucid dream frequency was six times higher. So, it seems clear that the delay contributes significantly to success with lucid dreaming.

The data from the prolonged sleep periods ruled out the possibility that simply being in bed 90 minutes after usual rising time is enough to cause lucidity. The last 90 minutes of the long sleep period turned out to be the worst time for lucid dreaming, also characterized by low dream recall. The next goal in the study of napping and lucid dreaming is to extend this study with many more participants, and to discover when is the best time to take the nap.

8. THE DREAM CLOCK [X: NL 2(4); U: NL 3(2)]

For this study, people were simply to note the times when they awakened in the night, and whether they had just awakened from a dream or a lucid dream. This was part of the effort to discover the relationship between lucid dreaming and biological clock cycles.

Sixty-four people contributed, making a data set of thousands of awakenings. In 79 percent, people had just had a dream. Ninety awakening were from lucid dreams (7.6 percent), meaning that about ten percent of dreams remembered were lucid. That is a very high number! It seems that simply sleeping with the intention to be aware of what is going on during the night, whether one is awake or asleep, is enough to stimulate lucid dreams for many people. Almost 60 percent of the participants had at least one lucid dream during the week in which they were collecting times of awakening.

As for the times, lucid dreams happened on average later in the night than non-lucid dreams, and non-lucid dreams happened later on average than awakenings with no dreams recalled. This corresponds to previous work demonstrating that lucid dreaming probability increases with time of night. In fact, 90 percent all of the lucid dreams in this study occurred after 4 hours of sleep, and fully one half after 6.5 hours of sleep.

This is a very important finding. It clearly implies that, if we assume that lucid dream induction techniques are most effective when applied closest in time to the time when we hope to have a lucid dream, it would be best to focus our efforts as close to the optimal time for lucid dreaming as possible. The "Back to the Nap" experiment also indicated that wakefulness and induction exercises work better when practiced at 6.5 hours into a sleep period than at the beginning of the night.

9. BIOLOGICAL RHYTHMS, THE NASAL CYCLE & DREAMS [X: NL 3(1); U: NL 3(3)]

In studying the relationship of lucid dreaming to the daily cycle of waking and sleeping, it is essential to consider the biological rhythms involved. In addition to the well-known 24 hour circadian cycle there are shorter cycles, called ultradian. One of these appears in the form of shifting dilation of the nostrils. If you hold one nostril closed and breathe through the other, and then switch nostrils, generally you will find that one nostril is easier to breathe through than the other. The change from left to right seems to follow an approximately 90 minute cycle.

Some research has suggested that the nasal cycle may be connected to cycles of activity in the brain and also to cognitive abilities. Furthermore, a shift in nostril dilation can be produced by pressure on a reflex point on the side along line beneath the armpit. Possibly, then, one could effect a change in cognitive activity by deliberately pressing on this point.

In the oldest available references on lucid dream induction, the thousand year old text on Dream Yoga in the Tibetan Buddhist tradition, is the advice to the initiate attempting to achieve a lucid dream that he should sleep "on the right side, as the lion doth." It is possible that the purpose of this posture is to encourage the type of brain activity conducive to lucid dreaming. After all, most of our current knowledge about reflex points on the body is found in ancient yogic texts.

This experiment examined the effect of sleeping posture on chances of lucid dreaming and attempted to assess if nostril laterality bore any relation to posture and lucid dreaming. The results were complex and difficult to interpret, showing that this type of study is probably best done in a laboratory under well controlled conditions. The procedure asked people to note when they awakened in the night, whether they had been dreaming, or lucid dreaming, which nostril was most open and to rate their dreams on several scales. The finding to take home from this study is that indeed, people had three times as many lucid dreams when sleeping on their right sides (as the lion doth?) than when sleeping on their left sides. Back sleeping presents a more complicated picture, also seeming to be better than sleeping on the left, but here we must examine other factors, such as which nostril is open. Further conclusion is deferred until a laboratory study is accomplished.

10. DREAM RE-ENTRY AS A WAY TO LUCID DREAMING [X: NL 3(2); U: NL 3(4)]

There are two primary types of lucid dream. Dream induced lucid dreams (DILDs) occur when the dreamer becomes lucid while involved in an ongoing dream. Wake induced lucid dreams begin when a person enters directly into the dream (and REM sleep) from the waking state with continuity of awareness. The latter kind of lucid dream shares many features with the phenomenon often refereed to as "out of body experiences" (OBEs). Indeed, our theory is that OBEs, like WILDs, most commonly occur during conscious transitions from waking to dreaming, the difference being that in the former dreamers believe themselves awake, while in the latter dreamers know that they are dreaming.

One important reason for connecting WILDs and OBEs is that they share phenomenological features. The experience of vibrations, strange noises, electrical sensations, feelings of weight on the chest and difficulty breathing, and floating -- sometimes with the sensation of peeling out of the body are common to both. The primary intent of this NightLight experiment was to see whether these sensations could be deliberately evoked by attempting to initiate WILDs, and if so to find their frequency of occurrence. Another purpose was to compare methods of WILD induction. The procedure was carried out in the context of attempts to re-enter dreams, under the assumption that the best time to directly enter the REM state is immediately after having awakened from it.

The first method was counting to sleep. The instructions were to sleep with the intention of noticing awakening from a dream, and upon awakening to begin counting, "One, I'm dreaming; two, I'm dreaming; etc." until asleep. The other method was a body-oriented technique of passing attention around 61 points distributed all around the body in an orderly sequence. Both procedures were based on the principle of maintaining mental vigilance while the body's physiological systems pass into the REM sleep state.

The most striking, and unexpected, result of this experiment was that one out of five attempts to re-enter the dream state resulted in a lucid dream! There were 191 attempts to re-enter dreams (from 30 participants). Sixty-one percent of these attempts were successful, and one third of the re-entered dreams were lucid. Furthermore, two-thirds of the participants reported having a lucid dream as the direct result of the dream re-entry procedure.

Addressing the original purpose of the study, the examination of sensations occurring on the border of waking and dreaming, 62 percent of participants experienced at least one of the phenomena on the questionnaire. These were: paralysis, weight on chest, vibrations, buzzing (or other noises), and floating or sinking. The significance of this is that these weird feelings are not rare or anomalous. Apparently, they can happen to anyone. People often describe their sleep paralysis or OBE experiences as terrifying, perhaps reflecting on their mental health. There is no need for such anxiety. The fascinating transition between the two states of consciousness, the two worlds of waking and dreaming, is nothing to dread, but should provide much interest for researchers of the mind.

11. CREATIVITY IN DREAMS & WAKING LIFE [X: NL 3(3); U: NL 4(1)]

Common knowledge tells us that dreams are weird. In technical language, dreams contain bizarre elements. One question is, are dreams more bizarre than other mental experiences? That is, is their something about the dream state that produces more nonsensical or unordinary associations than such purely mental activities as storytelling, fantasizing, and remembering. Where does lucid dreaming fit into the scheme of things?

There has been some debate among dream scientists about whether dreams are really more bizarre than fantasies. The question is important in that it bears on what is actually happening in the brain in the dream as compared to in waking. This experiment attempted to study these factors, under the guise of examining creative output in various waking mental activities and in lucid and non-lucid dreams. This is the first stage of an ongoing project to analyze the cognitive correlates of dreaming.

The five types of mental experience studied were lucid dreaming. non-lucid dreaming, fantasizing (really daydreaming), storytelling, and remembering. The instructions asked people to write a report of each type of experience. There were some difficulties with the data collection. Much misunderstanding arose regarding the fantasy, with several participants not carefully reading the direc-

tions and generating deliberate fantasies rather than capturing spontaneous daydreams, as requested. Furthermore, the memory task was confounded in that it did not ask the people to first remember the event, then report on the memory which would have been parallel to the other tasks.

The clearest result came out of an analysis of the frequency of bizarre elements. The experimenters judged each report, without knowing whether what kind of mental experience it represented, for the occurrence of discontinuities (sudden scene or topic shifts) and inconsistencies (anomalous combinations of events, places, or things). Lucid dreams and dreams both contained more bizarreness than memories or fantasies, as one might expect. The stories collected were stories made up about dreams. They contained as many inconsistencies as dreams, perhaps because people expect inconsistencies in dreams and include them in made-up dreams. In any case, the indication is that more strange things happen in dreams than in waking life. More research will butter more bread.

PLEASE JOIN US IN MAKING THE FUTURE OF LUCID DREAMING

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Testing the Limits of Dream Control: The Light and Mirror Experiment

by Lynne Levitan and Stephen LaBerge

Lucid dreaming offers the promise of enhanced control over dreams. Yet the question remains quite unanswered of how much dream control is possible. The ability to have lucid dreams also makes possible a way to study this issue. After having attained lucidity in a dream, dreamers can choose to carry out predetermined experiments testing their ability to achieve certain goals. In the "Free Fall" issue of NightLight (Vol. 4, No. 4) we asked lucid dreamers to attempt certain tasks in lucid dreams and to report on the outcome. An introduction to the many viewpoints on dream control will put the findings from this study in context.

WAYS OF CONTROLLING

The definition of "control" used here is "the ability to determine or influence the course of events." This means that an individual's actions are causes with subsequent effects. One way to refine this definition is to distinguish between voluntary and involuntary control. Voluntary control means that you decide you want to produce a certain effect and take steps to cause it. For example, you want the house to be cleaner so you throw away stray papers. Involuntary control refers to unintended consequences of your actions. For example, one of those stray papers you threw away was the outline of the presentation you are to give tomorrow. The result is you have to write a new one. In a dream, an example of an involuntary effect would be causing a dream monster to pursue you by running away.

There are different ways to approach controlling dreams. A method that does not require lucidity is predetermination: selecting the setting or topic of the dream prior to sleep. This is akin to the idea of "dream incubation" in which a person works to induce a dream about an important topic in order to answer a question or resolve a conflict. In her book, Creative Dreaming, Patricia Garfield presents some evidence that motivated people can choose to dream about desired topics. Post-hypnotic suggestions have also been employed in attempts to elicit particular dream topics, again with some success, as described by Charles Tart in his essay in Conscious Mind, Sleeping Brain, edited by Gackenbach and LaBerge (1988). Success with creating a particular dream setting, however, does not imply the ability to control the sequence of events in the dream.

Concurrent control is ability to determine or alter the course of a dream in "real time," as it happens. This type of control is not limited to lucid dreams, anymore than our effect on the waking world is limited to times when we are thinking about what we are doing. Anytime we make a choice or act in a dream, we are controlling it. We may be unconscious of the reason for our choice, but the decision nonetheless originates within the self. However, people possessing lucid consciousness in their dreams are able to make deliberate choices and actions with full knowledge that they are experiencing a dream, and observe their effects on the course of the dream.

The question addressed here is how well can we influence dreams in the directions we desire? Do actions produce the aimed-for effects? Do we have more or less control over our experiences in dreaming than in waking?

THE RANGE OF OPINIONS REGARDING DREAM CONTROL

In the modern world, a wide variety of theories and opinions about the possibility or impossibility of dream control coexist. At one extreme, stand (or, perhaps, stood, as this viewpoint may have faded in the face of irrefutable evidence) some sleep researchers whose reluctance to believe in the possibility of deliberate dream control came hand in hand with their disbelief in the verity of lucid dreaming. Their opinions rose out of a faulty philosophy defining sleep as "unconsciousness," meaning lack of cognition. A better operational definition of sleep would be, "lack of perceptual awareness of the sleeper's environment." Without consciousness, clearly one could not consciously will anything. So, until an awareness arose among those studying dreams that dreaming was a state of consciousness, not unconsciousness, progress was not possible in this area.

Another kind of disbelief has arisen from dreamworkers, who employ dreams to help people achieve better psychological balance. Much of dream-based therapy (although not all) has operated on the premise that dreams are things that happen to people, rather than events that people create. The creator of dreams has been named the "unconscious." Because of this and the prevailing notion in the scientific world that sleep is unconsciousness, it has become common for people to believe that dreams occur in the unconscious mind, independent of the conscious "ego."

This cannot be true, however, because if it were, we would not be able to recall the experiences we have in dreams. Events that do not reach consciousness are not accessible to memory. The "I" of the dreamer, the one who sees, hears, feels, and reflects on the events happening in a dream is the self-awareness, the "ego," and it is conscious, although it may not be aware that its present circumstance is an entirely mentally-constructed world not guided by sensory information from physical reality.

As an illustration of the point of view that dreams are both from and in the unconscious, here is an excerpt from Working with Dreams by Ullman and Zimmerman:

> Q. Can we program or control our dreams?
>
> A. No, not consciously. If we look upon a dream as a kind of natural resource flowing within us, if we liken it to a river, a river shaped by our life experience, then its flow will not be changed simply by having someone on the shore urge a new direction on it. But if the person on the shore does the work necessary to make a change in direction possible, the flow will alter as desired. The point of the analogy is that there has to be more than conscious intent to influence the flow. There has to be a genuine emotional investment.

In the view expressed, dreams are predetermined "plays" somehow programmed out of the individual's current psychological processes. They are nothing like waking life. These same authors make an interesting comment about lucid dreaming. They state: "Although the dreamer can influ-

ence the subsequent course of dream once it becomes a lucid dream, the element of control occurs only within certain limits. An analogy might be Living Theater where, after the actors have created a certain framework, the audience is invited to influence the subsequent course of the play."

This statement implies that dream control is limited to actions appropriate to the original setting of the dream, which has its own defined boundaries and rules. This seems to imply that whatever part of the mind determines the original dream setting has primacy over other parts of the mind. Certainly, one of the great mysteries of dreams is what determines the original setting and situation one finds oneself in a dream. Despite reports that some people are able to decide what they will dream about on occasion, for the most part, dream topics seem to arise out of some source that is definitely not in consciousness. However, there is no evidence in support of Ullman and Zimmerman's contention that dream control is limited by the framework of the original dream setting, and many would refute it based on their own experience.

The Tibetan Buddhists, creators of the Dream Yoga, teach that it is possible to control every aspect of dream imagery. They use dream control as a method of comprehending the illusory nature of all experience, with the ultimate goal of transcending the relative and embracing the Absolute. In the "Doctrine of the Dream State" from Tibetan Yoga and Secret Doctrines translated by Evans-Wentz, we find the following instructions:

At the outset, in the process of realizing [the dream] to be maya,

abandon all feeling of fear;

And, if the dream be of fire, transform the fire into water,

the antidote of fire.

And if the dream be of minute objects, transform them

into large objects;

Or if the dream be of large objects, transform them

into small objects:

Thereby one comprehendeth the nature of dimensions.

And if the dream be of a single thing, transform it

into many things;

Or if the dream be of many things, transform them

into a single thing...

Then, the editors comment:
By such practices, the yogin is taught to realize that matter, or form in its dimensional aspects, large or small, and in its numerical aspects, of plurality and unity, is entirely subject to one's will when the mental powers have been sufficiently developed by the yoga. In other words, the yogin learns by

actual experience, resulting from psychic experimentation, that the character of any dream can be changed by transforming or willing that it shall be. A step further and he learns that form, in the dream-state, and all the multitudinous content of dreams, are mere playthings of the mind, and therefore, as unstable as mirage. A further step leads him to the knowledge that the essential nature of form and of all things perceived by the senses in the waking state are equally as unreal as their reflexes in the dream state..."

The Tibetan Buddhists, however, were and are not given to sharing their personal dream experiences, so we cannot examine the nature of their dreams and their efforts to control them. Some notable Western expert lucid dreams have given us a look into what they have been able to accomplish. The Marquis d'Hervey de Saint-Denys was an extraordinarily accomplished lucid dream and wrote instructively about his experiences. He exhorted his readers to strive to control their dreams in his 1867 book Dreams and How to Guide Them:

Those who would see in the incidents of our dreams merely a succession of mechanically produced impressions over which one has no more control that a simple spectator has over some pictures will naturally declare any effort and any exercise of attention or will to be incompatible with the very nature of dreaming. Since the most valuable observations I have been able to make seem to me to be due to my ability to maintain the faculties of attention and will during sleep, I shall naturally place great emphasis on convincing the reader that he can and should exercise the same control over himself. Here I come to what is perhaps the most interesting of my new propositions, and one that is open to experimentation on any reader's part. For it is through the combined action of attention and will during dreams that one can take the first steps in directing and modifying the course of dreams as one wishes.

Perhaps no one has experimented personally with dream control as much as Alan Worsley, the inveterate lucid dreamer who can claim to be the first to signal lucidity with eye movements in a sleep laboratory. First, a comment from Worsley regarding voluntary and involuntary control in dreams: "Non-lucid dreams use many principles that can be used in lucid drams. For instance, it is likely, in a non-lucid dram, that if one believes one looks into a book about a certain subject, one will find relevant pictures in it. In lucid dreaming, one can use this principle by deliberately selecting a book about a subject one wishes to study."

Worsley has tabulated his attempts to influence dreams. A complete table of his results appears in Conscious Mind, Sleeping Brain, edited by Gackenbach and LaBerge. He rates the difficulty of various tasks as Hard, Medium, and Difficult, based on the percentage of times he was able to succeed at them. For example, he finds all attempts to penetrate dream matter with his dream body to be easy. Making sounds by striking things or speaking is easy. Reading single words or short phrases is easy, but reading long sentences is hard. He was never able to suddenly turn on a light in a dark room, although he was able to do so easily in a light room. Flying close to the ground was easy, and got progressively more difficult the higher he would try to go.

EXPERIMENTAL STUDY OF DREAM CONTROL

The wide range of opinions on the topic of dream control, and the reports we received of people's attempts to control dreams, piqued our curiosity about why it is sometimes it possible to achieve a desired outcome, and sometimes it is not. Because dreams are entirely illusory, it should be possible to experience anything imaginable. Thus, perhaps failures arise from not imagining strongly

enough, or not believing a certain experience is possible. On the other hand, perhaps there are physiological limitations on the ability to control dream imagery.

Our theoretical approach to dreams is based on the idea that the perceptual experiences in dreams arise out of activity in the same brain areas that produce perceptual experience in waking. This is why people have difficulty distinguishing dreaming from waking experience, and have to employ special techniques to recognize when they are dreaming. Physiological constraints on dream perception might occur if a certain brain area is not in a state conducive to the desired experience. For example, it might be hard to make a dark dream light, because the visual cortex is not active enough. This is one of the topics of research we would very much like to see explored: the relationship between dream perception and brain activity.

The NightLight study was designed to assess how successful people would be at accomplishing certain well-defined tasks in lucid dreams.

1. LIGHT SWITCH TASKS

A. Find a light switch (indoors).

B. Turn it on, and see what happens, then turn it off, and see what

happens.

C. Turn the lights on and off by willing it to happen and observe the

results. (These two tasks were counterbalanced so that some tried the

"magic" first and some second.)

2. MIRROR TASKS

A. Find a mirror.

B. Observe your reflection in the mirror.

C. Move your hand to your face, watching it in the mirror and observe

how the reflection behaves.

D. Pass through the mirror and see what is on the other side. (The

instructions gave an example in which the dreamer passes through the

mirror and ends up in a different scene.)

These tasks represented a variety of types of influence, ranging from things that are easy to accomplish in waking (turning on a light, looking in a mirror), to impossible in waking (passing through a mirror). In addition, some tasks we thought might be impeded by brain state were included (the changing of light level). The purpose of asking people to both will a light on and off and switch it was to see what effect belief might have on the outcome. It is easier to believe a light will turn on when a switch is flipped than that will alone will turn on a light.

The instructions asked the participants to try each task in waking prior to attempting the tasks in lucid dreams, so that they would have the procedure well-rehearsed. Then, they were to try each task at least once in a lucid dream. They did not need to complete all the tasks in one dream, but could use as many lucid dreams as they needed. So that they would not forget details, the participants were asked to awakening immediately after the experimental lucid dreams and make complete reports of their experiences.

RESULTS

Twenty-seven people submitted reports of their attempts to carry out the assigned tasks, fourteen women and thirteen men. Altogether they provided 65 lucid dream reports, an average of 1.4 per person. The maximum number of reports from one individual was four.

A judge reviewed the reports to determine which tasks were attempted in each dream, and scored the result. The scoring for the tasks of finding a light switch or a mirror was either as "success" or "failure." The results of the actions of turning a light switch on and off, willing a light on and off, looking at a reflection, touching hand to face, and passing through a mirror received scores of "expected" if the result achieved the goal, "no result" if the action produced no response, and "unexpected" if something unpredictable happened.

"Expected" for turning and willing a light on and off meant that the light went on and off as it would in waking. "No result" meant the light did not change. "Unexpected" meant something other than the chosen light turning on and off. Examples of unexpected light results were: "the bulb slowly filled with what appeared to be thick, black tar," and "When I threw the switch, the outside porch light came on instead of the room light...didn't really increase the overall illumination."

For the task of looking at a reflection, a score of "expected" was given when people reported that their reflections in the dream looked like their reflections in waking. "No result" indicated that the person saw no reflection. This happened once; the person instead saw gray, swirling mist. If the reflection looked unlike the waking image, the result was rated "unexpected."

The same criteria as for the reflection applied to moving the hand to the face while watching in the mirror. An example of "unexpected" for this task was, "As I raise my hand to my face I see the reflected image of my hand go up but from then on I notice an increasingly 'hallucinogenic' breakdown of the image--such things as my finger, detached from my hand, disappearing into my mouth and holes appearing in my face."

The result of trying to pass through a mirror was scored as "expected" if the dreamer was able to move through the mirror and found another setting on the other side. "No result" meant that the dreamer found the mirror hard and unyielding, as in waking. "Unexpected" applied to cases in which the dreamer got through the mirror, but was then somewhere unlike what was described in the task instructions, for instance, in the same room, or "in a world of cartoon-like images."

The table [below] shows the results of the participants' tries at the tasks. The left-hand columns list the number of people who attempted each action and the number who achieved each kind of result. The right hand columns display the total number of tries at each task, and the number leading to each result.

Looking at the number of "expected" results, that is, cases in which the action produced the desired result, it appears that "willing" a light to turn on or off and using a dream switch are about equally easy. There seemed to be more cases of "no result" with willing the light on, but the difference did not pass a statistical test. The data hint that it may be easier to get a dream light to turn off than on. However, this conclusion may be premature, given that in the majority of cases, before trying to turn off a light, the person had already succeeded in turning it on. There may be a condition in which if you can turn on a light in a dream, you can also turn it off.

Clearly, it was very easy to find things in dreams that are usually around in waking, like a light switch and a mirror. People also had no difficulty performing the normal action of looking in a mirror and seeing a reflection, although it was more likely than not somehow different than the usual waking reflection, and in 12 cases (28%) the image transformed as the dreamer watched. This happened for 41 percent of the participants.

It would be reasonable to predict that passing through a mirror to another scene would be the most difficult task, given that it is impossible in waking life. However, almost half of those who tried succeeded, and 86 percent of the people were able to get their dream bodies through the dream mirror at least once, even if they did not end up in a new scene. An example of an "expected" mirror result was, "I then went through the mirror and tried to imagine that the mirror was like water so I could easily slide through it. When I was fully through the mirror, I came up to the surface of the water I was in and noticed I was in a bright, sunlit backyard swimming pool with a roof shelter over it."

DREAMS CAN BE DIRECTED, BUT STILL DO THEIR OWN THING

The lack of large differences in the ease of accomplishment of the various tasks is in itself quite interesting. Lucid dreamers are able to exert a large amount of control over their dream experiences. But, it is far from perfect. Most notable is the reluctance of the mirror reflections to show normal images, and their fascinating instability. Self-image is of course a very psychologically loaded thing, probably with very complex internal representations. This may account for the strange images. The instability points up the most prominent difference between waking and dreaming perception. Dreams change. We exploit this in lucid dream induction training by instructing people to examine written phrases repeatedly, watching for them to change. An interesting question is whether the perceptual instability results from the lack of anchoring sensory input from the physical senses or from a state of the brain peculiar to REM sleep.

In their studies, the Marquis d'Hervey de Saint-Denys and Alan Worsley observed something they called the "light switch" phenomenon. This was an inability to change the illumination of a room on demand. From this study, it seems that this phenomenon is sometimes present and sometimes not. Some people who were able to turn on lights reported no concurrent change in general illumination, but others reported that there was an increase in brightness about half and half. So, "the light switch phenomenon" is not dead, but merely seems to be sleeping some of the time. A prime target for research would be to discover what the brain is doing under both circumstances.

It was rather remarkably easy for people to pass through a mirror and find something else on the other side. One might think, along the lines of the quote earlier from Ullman and Zimmerman, that a complete scene change would be a difficult thing to accomplish. In fact, we have already seen in another study that it is more than possible. In the results from an experiment published in the April 1987 issue of Omni magazine, 51 people reported trying to arrive a particular pre-selected target by spinning in a dream. Eighteen of them (35%) succeeded in arriving at their target. Thus, not only is it possible to create a new scene, but also to create one that is specifically desired.

In the final analysis, the Tibetan Buddhist view that all dream images are transmutable may be exactly right. If so, we wonder if it may be possible also to learn to control the stability of these images, creating lasting dream scenes and objects, achieving a state of virtual reality far beyond the wildest dreams of the computer programmers.

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Lucidity Research, Past And Future

By Stephen LaBerge, Ph.D

There is a state of consciousness in which any human being could experience anything imaginable. Each of us holds within us infinite possibilities. How many of us ever have the opportunity to taste even a hint of them? If we speak of our fantasies of wider vistas of life, we talk of our "dreams." In our dreams, we are free. A man in a dungeon can dream he is a king in a castle, and while he dreams, it is so.

People have long viewed dreams as blessings or curses beyond our control. However, according to Tibetan Buddhists, who for a thousand years have been practicing a form of dream yoga, similar to what in the west is called lucid dreaming, it is possible to gain complete mastery over dreaming. Recent scientific research at Stanford University has begun to provide objective evidence for that claim.

As is well known to NightLight readers, lucid dreaming means dreaming while knowing that you are dreaming. Everyone has, in theory, the capacity to learn to dream lucidly, because everyone dreams every night. Whenever we dream, we find ourselves in complete worlds, as richly detailed, moving and impressive as the world of waking life. This ability to create worlds is the natural endowment of the human mind. In dreams, this wondrous talent is fully demonstrated. The worlds we create in our minds are so convincingly real we cannot easily tell them from the "real" world of waking.

Lucid dreamers develop a frame of mind that allows them to recognize when they are dreaming. From that point, they are free to do as they choose. This freedom, hard to imagine in our highly constrained waking reality, is astonishing, exhilarating, and inspiring. The laws of physics and society are repealed. The limits are only those of the dreamer's imagination.

Who would not want such a genie at their command? Today, lucid dreaming is a reality, currently being enjoyed and explored by thousands of people. However, for it to achieve its potential of expanding the horizons of all humanity, research advances are necessary. Current training in lucid dreaming takes more time and effort than most people are able to commit. Technology exists to assist people in attaining the state, but although it can greatly enhance a person's chances of having a lucid dream, cannot yet guarantee it.

Research into the factors of brain and mind that underlie the lucid dream state could lead to breakthroughs allowing an individual to lucid dream at will, thereby having reliable access to any imaginable experience. This is much more than a remote possibility. Much is already known about REM sleep, the sleep state in which lucid dreaming occurs, and progress has been made in determining how brain activity changes when a person becomes lucid in a dream. Resources are needed for initiating intensive research into the precise nature of the lucid dream state, and the factors of brain, body and mind involved in achieving and sustaining it.

A convenient and reliable means of entering lucid dreams will open the door to a vast treasury of valuable applications. In worlds of unlimited possibility, creativity will become the rule, rather than the exception. People will be able to sample any way of being they wish, living out fantasies unavailable in waking life, or rehearsing for successful futures.

Experimentation in lucid dreaming is completely risk-free, so ideas in business, politics, ecology, athletics, or indeed, any endeavor can be tested in the model world of dreams. Practice in lucid dreams can improve performance, and prevent costly errors in waking reality. The potentials of mental imagery and hypnosis will also be accessible to everyone, because dreams are the most vivid of all images, available even to those who do not have the ability to create vivid mental imagery or to enter deep hypnotic states while they are awake. This brings with it the possibility of enhanced healing capacities, hinted at in research on mental imagery. People may be able to use lucid dreaming to shorten the time it takes them to recover from illnesses or operations, and to stimulate the redevelopment of physical skills following injury.

All that is required to bring these possibilities to fruition is the devotion of research effort into the area of lucid dreaming. The more resources are supplied to this work, the more rapidly progress will occur, and the sooner this priceless tool will be available to help humanity overcome its present crises. It is abundantly clear that we are in need of quickly developing our capacities for understanding our role on Earth and creatively evolving to survive and grow into our true potential. Lucid dreaming offers great promise for helping us to achieve these goals.

With my colleagues (notably, Lynne Levitan and William Dement), I have been researching lucid dreaming at Stanford University for over a decade. I founded the Lucidity Institute to advance research on lucid dreaming and potentials of human consciousness, and to apply the results of this research to the enhancement of human health and well-being.

The Lucidity Institute has advanced towards the goal of making lucid dreaming universally accessible by developing commercially available lucid dream induction devices such as the DreamLight and DreamLink that help people have lucid dreams.

We are continuing research at Stanford aimed at enhancing the ability to have lucid dreams, and tapping the great potentials within them. Those wishing to contribute to the advancement of research on lucid dreaming please consider the following:

* A tax deductible donation to Stanford University, directed specifically "for research on lucid dreaming under Dr. Stephen LaBerge."

* A loan or investment in the Lucidity Institute, Inc. (Currently the Lucidity Institute Private Placement Memorandum is offering $600,000 worth of stock. Approximately $200,000 has been sold already, leaving $400,000 available.) The Lucidity Institute will provide long-term research funding.

The general aim of our ongoing program of research is the investigation of consciousness and mind-body relationships during sleep. Our primary focus has been lucid dreaming , a state of consciousness with remarkable potential. During lucid dreams, people can reason and remember clearly, and act volitionally upon reflection, while remaining sound asleep and continuing to dream vividly (1).

Lucid dreaming makes possible a new paradigm for dream research. Because lucid dreamers can carry out specific dream experiments, control their dreams and communicate with the laboratory while still asleep (2), scientists can now study the dream state directly. We have pioneered the laboratory study of lucid dreaming (1,2,3) at the Stanford University Sleep Research Center, and thus are well positioned to employ lucid dreaming in the study of the nature of human consciousness and to explore the applications of lucid dreaming in health improvement.

INDUCTION OF LUCID DREAMS

Although we have shown that lucid dreaming is a learnable skill (8), currently available methods, involving mental concentration, require considerable investment of time and effort. Therefore, we have sought methods for helping dreamers to realize that they are dreaming by means of external cues applied during REM sleep that become incorporated into dreams and remind dreamers that they are dreaming. We have tested a variety of stimuli, including tape recordings of the phrase "This is a dream" (9), conditioned tactile stimuli (10), and light (11). Light appears to be an excellent stimulus. We have developed computerized lucid dreaming induction devices (the DreamLight, DreamLink, and most recently, the NovaDreamer) that have produced highly promising results. By further developing and perfecting these and new devices and techniques, we hope to make lucid dreaming widely available.

Lucidity cue type and mental preparation: Preliminary studies on the DreamLight device have been promising: 55% of 44 subjects had at least one lucid dream during one study (11). Unpublished research indicates that combinations of the light cue with mental exercises specifically designed to increase one's awareness of the nature of dreaming tend to be more effective than using the cue alone. At this point we do not know what rate of flashing will be most effective. Therefore we plan to compare four different flash rates (1, 2, 4, and 8 flashes per sec) and three different kinds of mental preparation (MILD, discrimination training to recognize the light stimulus, and post-hypnotic suggestion) in a group of 40 subjects. We also are planning testing cues in other sensory modalities such as sound and vibration.

Physiological correlates of dream content and incorporation of stimuli: Four channels of EEG and four channels of autonomic physiology is being collected from each of 12 to 24 subjects as they are stimulated with flashes of light during REM sleep. Reports of incorporation of light as well as other dream content will then be correlated with the EEG and other physiological measures. Sometimes the subjects will see the light flash in their dreams, but sometimes they will not. Using a computer, we will analyze the EEG and autonomic physiology immediately prior to the time that the stimulus is triggered, looking for differences between the cases when the light is incorporated, and when it is not. By showing us which are the optimal times for applying cues to the dreamer, this research should teach us how to more effectively induce lucid dreams with light.

MIND-BODY RELATIONSHIPS DURING DREAMING

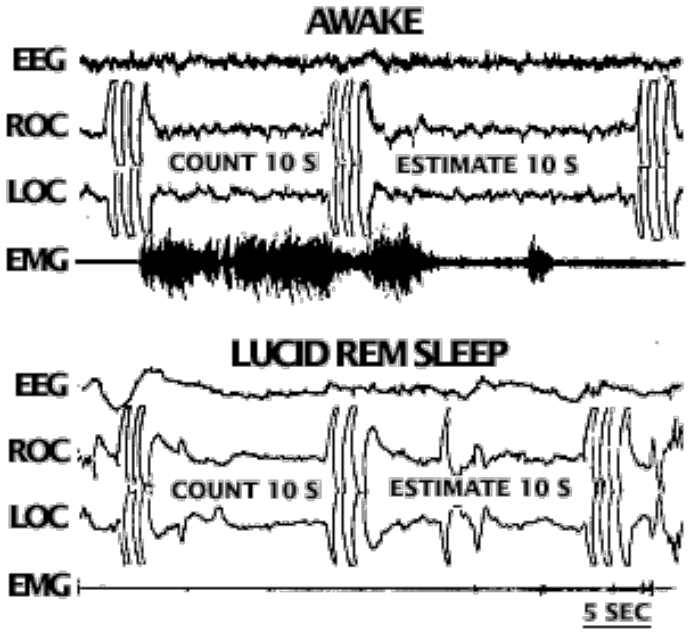
Our work with lucid dreams so far has led to new insights into the connection between mind and body. In a series of studies (summarized below) we have discovered that various dreamed experiences (including time estimation, breathing, singing, counting, and sexual activity) produce effects on the dreamer's brain (and to a lesser extent, body) remarkably similar to the physiological effects that are produced by actual experiences of the corresponding events while awake.

Correspondence between dreamed and actual eye movements. We have found that there is a very high degree of correlation between the direction of gaze shift reported in lucid dreams and polygraphically recorded eye movements, a fact that we make routine use of by using eye movements as signals in all of our experiments (1,2).

Communication from lucid dreams. We are also planning to improve the capacity of lucid dreamers to communicate with the waking world while dreaming. At this point, they do so by means of eye-movement signals, which are difficult to execute with any complexity. In past studies

we have done some preliminary work with a glove containing computerized movement sensors allowing the recording of hand movements during dreaming. The devices were too crude at that point to permit us to see the fine detail needed for distinguishing various hand signals. Current devices are much more sophisticated. We hope to make it possible for lucid dreamers to communicate by means of hand gestures (e.g., American Sign Language) so that we can have on-the-scene reports from the dream world. A glove with movement sensors will be used to study communication from lucid dreams by means of hand gestures, using five expert subjects.

Dream time How long do dreams last? We have been able to receive a direct answer to this age-old question by asking lucid dreamers to estimate various intervals of time while dreaming. The dreamers marked the beginning and end of estimated dream time intervals with eye movement signals, allowing comparison of subjective "dream time" with objective time. In each case, the intervals of time estimated during the lucid dreams were very close in length to the actual elapsed time (1), as shown in the figure below.



Time estimates during waking and REM lucid dreaming. [EEG: electroencephalogram, ROC, LOC electro-oculogram from right and left eye; EMG chin electromyogram.] While awake (top panel), the subject signaled with eye movements, estimated 10 s by counting, signaled again, estimated 10 s without counting, and signaled a third time. The lower panel shows the subject carrying out the same task in lucid REM sleep. The time estimates are very similar in both states.

Control of respiration during lucid dreaming. We recorded the physiology of three lucid dreamers who had been asked to either breathe rapidly or to hold their breath in their lucid dreams, marking the interval of altered respiration with eye movement signals. They reported successfully carrying out the agreed-upon tasks a total of nine times. In each case, a judge was able to correctly predict from the physiological records which of the two breathing patterns had been executed (4). We are currently collecting more data to further determine the precise nature of the dream respiration connection.

Brain function lateralization during lucid dreams. Alpha activity was derived from right and left temporal EEG while four subjects sang and counted in their lucid dreams. The results indi-

cated task dependent lateralization: the right hemisphere was more activated than the left during singing; during counting the reverse was true. These shifts were similar to those during waking singing and counting (5).

Physiological responses to sex in lucid dreams. A pilot study with two lucid dreamers (one male and one female) who reported experiencing sexual arousal and orgasm in lucid dreams revealed patterns of physiological activity during dream sex closely resembling those accompanying corresponding experiences in the waking state (6).

These studies indicate that the effects of dream events on the brain and body are much more like the effects of real events than like those produced by waking imagery (1). Because dream activities produce real physiological effects, lucid dreaming may be useful for facilitating health and healing, as an extremely potent form of mental imagery. We plan to continue our explorations of awareness in dreams along these lines with the goal of producing a detailed map of mind-body interactions during dreaming sleep for all measurable physiological systems. Such a map could prove to be of inestimable value for experimental dream psychology, as well as for psychosomatic medicine.

EEG mapping of lucid dreaming In past studies, we have determined that lucid dreams are generally initiated during periods of high autonomic nervous system activity--decreased finger pulse amplitude, increased respiration rate and irregularity, and increased eye-movement activity relative to normal REM sleep (12). These factors indicated that dream lucidity occurs during periods of relatively high brain activation, suggesting that sufficient activation of the CNS is necessary before consciousness can be attained. However, we had little idea what was specifically happening in the brain, whether the activation was general, or localized in some particular areas.

In a pilot study we mapped the distribution of brainwave activity from twenty-eight electrode placements on the scalp, examining different frequency bands of EEG during periods pre and post-onset of lucidity in five lucid dreams from one subject. The most interesting findings in this preliminary analysis were in the alpha band (8-12 Hz), where decreases of alpha activity were seen in the posterior left hemisphere, in the first 30 seconds of lucidity. This finding is in keeping with an earlier analysis we performed on a few of our lucid dreams at Stanford of left/right ratios of alpha activity, finding the only difference at lucidity onset to be a decrease of alpha activity in the left parietal region. Decreased alpha activity is generally considered an indication of increased brain activation. Indeed, lucid dreaming ought to be associated with left hemisphere activation, (where language is localized), since to become lucid one must actually spell out to oneself, "This is a dream."

We plan to add to and check our findings by collecting more data from more subjects. This will give us a larger sample of non-lucid REM for comparison and show what EEG differences are consistent for all lucid dreams. Thus, we will gain a basis for the comparison of lucid dreaming with other states of consciousness. Twenty-eight channels of EEG will be collected, and maps of EEG activity will be computed, allowing the determination of which brain regions are involved in lucid dreaming (and perhaps reflective consciousness in general). Five expert lucid dreamers will be studied.

APPLICATIONS OF LUCID DREAMING

In addition to being a powerful research tool in scientific explorations of the dream state, lucid dreaming also offers considerable potential for a variety of practical applications, which include aiding personal- development, enhancing self-confidence, overcoming nightmares, improving mental

(and perhaps, physical) health, facilitating creative problem solving, and more (1,7). There is a great deal of public interest in this area; we have received well over 10,000 letters from people around the world wishing to know more about lucid dreaming. For this reason, and because we believe lucid dreaming can benefit humanity, we feel that we have a service to perform in making the lucid dream state more readily accessible.

We would like to explore several potential applications of lucid dreaming. One is the use of lucid dreaming in overcoming nightmares. We have anecdotal evidence suggesting that lucid dreaming should be extremely beneficial to nightmare sufferers, giving them the means to overcome their own fears (1). Not only will they be able to alleviate their nightmare problems, but in so doing they will be able to increase their self-confidence and self-esteem. Lucid dreaming can be a very empowering experience, which is one of the reasons we would like to make it more readily available to people. An experimental self-help group for nightmare sufferers will be started and the efficacy of lucid dreaming to overcome nightmares will be studied and documented.

Lucid dreaming could provide the handicapped and other disadvantaged people with the nearest thing to fulfilling their impossible dreams: paralytics could walk again in their dreams, to say nothing of dancing and flying, and even experience emotionally satisfying erotic fantasies. Such sensorimotor practice could conceivably facilitate recovery from stroke.

Finally, lucid dreaming can function as a "world simulator." Just as a flight simulator allows people to learn to fly in a safe environment, lucid dreaming could allow people to learn to live in any imaginable world; to experience and better choose among various possible futures.

RESEARCH GOALS

Our goals are to further explore mind-body relationships and the expansion of consciousness during sleep through lucid dreaming. Specifically, we plan:

A. To make lucid dreaming more accessible by further investigations with biofeedback devices like the DreamLight

B. To study physiological correlates of dream content and of the incorporation of stimuli into dreams

C. To map the EEG correlates associated with the emergence of consciousness during lucid dreaming

D. To explore applications of lucid dreaming

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A Fool's Guide to Lucid Dreaming

By Lynne Levitan

EOPLE often want us to specify the criteria for lucid dreaming, asking, "Was this a lucid dream?" and describing some definite non-rationality in the midst of a lucid dream. Webster's definition of lucidity is: "clearness of thought or style," and "a presumed capacity to perceive the truth directly and instantaneously." However, the lucidity referred to in the term "lucid dreaming" as coined by Frederik van Eeden in 1913, refers only to perception of the truth that one is dreaming. This is much like the usage of the word "lucid" in psychiatry to describe a patient who is well oriented to time, person and place.

Knowing that you are dreaming, however, does not automatically guarantee full rationality. Then again, being awake doesn't ensure good thinking, either. Nonetheless, we get more comic relief out of the errors we make in dreams, even lucid ones, than the ones we make while awake. Why do we do stupid things in dreams? One of the possible reasons is that we are less familiar with dreams and how they work, because most of the time in them we assume we are awake and so miss out on many opportunities to learn the ropes. Another possibility is that the dreaming brain is actually less intelligent than the waking brain, at least sometimes. Perhaps there is something about the activity of the brain in REM sleep that, on occasion, makes the dreamer's actions seem like those of a brain-damaged person.

The "brain damage" theory is plausible, given that the electrical activity of the brain varies tremendously in REM sleep, from less to more than in waking. Maybe our inner experiences change along with that activity, ranging from dull and irrational, to ecstatic and sharp-witted. On the other hand, the majority of mistakes made in lucid dreams are probably the result of "dream naivete," that is, a lack of understanding of what is and is not appropriate to the time and place of the dream world. Until you have accumulated sufficient experience at testing the boundaries of dream reality, and overcoming inhibitions from waking life, then you are likely to misinterpret situations and overlook chances to try something new.

One way to look at rationality in dreams is to classify different levels of lucidity. At the highest level, the dreamer would not only be aware of dreaming, but also possess complete understanding of the implications of this knowledge, and would behave in accordance with that understanding on all levels from thought to action. The lowest, minimal level of lucidity would be realization of dreaming, but without understanding how dreaming is different from waking, and without acting on the lucidity at all, mistaking events, characters and consequences with those from waking life. Yet, degrees of rationality vary from moment to moment in dreams, so that one wishing to use a scale of levels of lucidity would have to rate each decision, action, or response of the dreamer independently. Averaging the lucidity levels in a dream might be a way of establishing a lucidity "score" for the dream. All of this is for future research to decide.

As a start on approaching this issue, I picked 38 instances of irrational thoughts and actions from lucid dreams. Half came from my own dreams (so no one should feel I'm picking on them), and half from the lucid dreams submitted for the "Minds & Machines" experiment written up in this issue's Research Update. I have classified them into categories of different types of errors. Three categories covered most of the examples.

1. Being Afraid of "Physical Harm"

There are certain kinds of situations in which action is reflexive, not awaiting decisions from the conscious mind. Fearful circumstances are one example. It is much better for our skins, in general, if we respond quickly to danger, in a way that will increase our chances of avoiding harm, usually running away, less often fighting. Consciousness can override behavioral impulses resulting from fear, but is unlikely to do so without good reason, decided on in advance. For example, some people decide that, for the pleasure of skydiving, they will ignore the terror involved in jumping from an airplane 10,000 feet above the ground.

I go into the closet and throw myself out the window. Briefly, I doubt if I'm dreaming, again, and get stuck halfway through the screen. Wow, what if I weren't dreaming, I think; I'd be killing myself!

I became aware that I was lucid and started to change my size and quasi flying with the Jeep. When I noticed the other cars I became worried and pulled over for concern of safety. I lost lucidity...

I want to go into the house, so I fly up to a window on the second story and try to fly through. I bump into the screen. I tell myself that I should be able to get through. I'm banging against the screen with my hand and scraping myself up a little. I'm not entirely lucid because I think even though I'm dreaming it's probably not wise to get cut up like that.

...I reflect on the lucidity itself as being so effortlessly stable that I don't even have to try or struggle to maintain it....I am in a cafeteria type place and remember my intention to look for lottery numbers...[looks for lottery numbers]...I ask if there are any Lotto 6/49 machines around am told there is one--at a nearby tourist centre on the edge of the [military] compound. I go there and find myself walking down a slightly wooded lane. There are some men doing something that looks covert. I hesitate, then proceed and seeing others around am reassured....

The next example illustrates how lucidity can help negate irrational fear:

Spinning is easy. I see a chart of words--which seem to be possible dream selections. I choose the one that says, "Joy Traveler" and don't remember any others. I come to a scene in my parents' living room with Fred standing next to me. The light is dim blue. Fred has no shirt on, is tan, with golden highlights in his hair and no hair on his chest--he looks good. I go outside with him, to the front yard. I say, "Fred, you never have lucid dreams. Indeed, you rarely remember your dreams." He agrees. As we're crossing the street, Fred ahead of me, I see a car at the corner backing up. I tell Fred to watch out; this car is backing up towards him. We fly up into a tree and hold on. The car drives back at us (going forwards now), so I figure it really was trying to hit us. I tell Fred to fly higher into the tree. I realize I am feeling some fear and it's of this car. I decide I should deal with it rather than going somewhere else. I yell to Fred, "Merge!" and as we dive at the car, I hear him making a grunt of surprise and shock. The car comes up slowly. A flap opens in the top and shoots projectiles out. Then a stereotypical terrorist with a gun leans out the back. I note all this and keep falling at the car. When I hit: "POOF" and the scene vanishes. I see notes on paper float before me and think, these are of no interest to me and I feel myself wake up.

2. Being Afraid of "Social Consequences"

Social interactions are another case in which behaviors are automatic. As children, we learn how to behave in a variety of social circumstances, the difference between public and private, and the consequences of breaking the rules. Parents discipline their children to train them to act "correctly,"

and peers punish with ridicule, exclusion and violence when a child does something "forbidden," such as urinating or crying in public. As we mature, we internalize this training to make it unconscious, because even a momentary slip-up can cause severe social consequences. Once social rules become unconscious, only deliberate conscious decisions can override them.

The people populating our dreams are only mental images of people, with no power over our social standing in waking life, yet they look and act completely real. It can be extremely difficult to ignore the dictates of our social training when faced with wholly realistic "people." The following analogy might make the challenge understandable in a waking context: Imagine you are in a room with a window into another. It is a one-way window that allows you to see into the other room, where a group of people is sitting, looking in your direction as if watching you. However, they cannot see you, because their side of the window is mirrored. How would you feel about undressing, using the toilet, picking your nose, having sex, or, say, singing, in such a situation? Now imagine that the "audience," although they cannot see you and do not know what you are doing, have shocked or amused expressions on their faces as you carry on with your embarrassing activity. Dream characters are mental images of people that we endow with the social reactions we have learned to expect from others. Thus, if you decide to take your clothes off in a dream, the dream people around you might act astonished, because that is what you would expect in waking life. Your knowledge that there are no actual people there is purely intellectual, contradicted by the evidence of your senses, which see and hear a social situation and automatically define for you appropriate and unacceptable behaviors. It takes solid lucidity and a strong will, at least initially, to overcome the internalized mental constraints of society in the essentially private world of dreams.

Wandering about again, I see some money on a table--a big stack, with a $1 bill on top. A minute later, it's a smaller stack with a $20 bill on top. I pocket it. Around this time the light flashes (DreamLight) and I reflect that it doesn't matter what I do 'cause it's a dream. But it doesn't sink in yet, and I'm a bit worried about being caught.

I find myself saying over and over, "This could be a dream," and say, "This is a dream." But I continue with the story because I'm very emotionally involved in it. I'm with B, approaching the place where M is going. B says something about B being with M and me and M replies with something about taking off as many clothes as we can when we get there. I wonder at this lack of discretion.

I'm in a foreign country staying at a hotel and I know there's a nice French girl in the reception area. I know I'm dreaming and I'm in a hurry to meet her before I wake up. I run through the building.... I find the girl and decide to go back to my room.

[Risks losing the girl to the instability of dreaming, probably because of a lack of awareness that there is no need to go to a private room for sex in a dream.]

Then the old woman says it's 21 something. Then she thanks me, and gives me some ... money, towards something. She doesn't look as though she can afford it so I don't take it at first, but then accept it so as not to hurt her.

3. Thinking Another Dream Character is "Really" There

One research aim in child psychology is to identify when children recognize that other people are like themselves in having emotions, needs, pain, pleasure, etc. Before that time, presumably, we treat ourselves as the center of the universe, and everything else as being important only in how it affects our well being. Once awareness of self and other dawns, our choices generally reflect concern

for others, although the degree of consideration we show others varies greatly. Fear of social consequences reinforces our social deference, which in common parlance we usually call "goodness." Being "bad" is being selfish or cruel, that is, not considering the feelings of others. Another way of describing this aspect of human psychology is to say that we learn at some age that other people are "real," like us, and to treat them accordingly. And so we do in our dreams, too. Of course, as long as we think dream characters are "really there," we are likely to be concerned about social consequences, as described above.

I believe that B is also dreaming and aware and thus we are having a "mutual dream."

Inside with M, we decide we're both dreaming and attempt simultaneous signals. I can't understand some of what he says, then he mutates to look like some food by Chef-Boy-Ar-Dee.

I see an arm coming from behind a tree, and tell myself, "That's him." So, sure enough, when I get there, it is S. He is wearing a belt with an amazingly shiny buckle in some angular pattern--this startles me a bit. We embrace and kiss--this is sort of insubstantial. Now he wearing shiny silver mylar pants, and looks like a slick cowboy. I am not too clear about it being only my dream. I have a few thoughts like--he'll remember this, too. He is very sharp and clear and startlingly real. I ask him to come with me and we'll fly. He doesn't believe it will work. I know it is me who is causing him to be uncooperative. I tell him it always works with my dream characters. I take his hands to pull him up.

I run down the hall into the kitchen, deciding on my way that I will do a back flip in mid air when I get there. I do it smoothly and land on my feet. ...I am full of energy but I don't know what to do next. I say that I want to do something little. At some point I eagerly suggest to M "Let's go wake up your sleeping body!" I mention something about flying through people. M says, "You can't fly through me unless you are some alien who can get up my nose." I begin to think something like "I don't think anyone can fly through you (if you're real) not even aliens" but fear saying it before "one appears and proves me wrong." I tell M that I've flown through dream people before and if they were real it must have been an offensive act. (This seemed logical at the time; that the dream people could be real.) If they were real then I am sorry that I flew through them.

As the bad guys get out of the truck, we fly into the air. I call to my dog, and he flies up to me, and we fly and fly. It's all so easy and I'm very relaxed. Knowing that I'm dreaming, I try to think of other interesting dream places I've been to so that I can show them to my sister. I lucidly fly out of the dangerous dreams I remember and take her to some fun places.

I know I'm dreaming as I fly about with R and others. I encourage R to try to remember this experience [not lucid enough to realize I'm talking with a dream character]. We hover in front of a striking glass picture of pale green hues, with flower designs embossed into its surface. I tell R that lucid dreams are even more easy to recall than non-lucids.

I was walking in a building. I was going to meet with some people. My plan was to meet in a dream with people I was going to meet in waking tomorrow. Then, I would compare the waking meeting with the dream meeting. (I don't know from where this idea came. I never considered this experiment.)... I lost lucidity.

Steve and I and Sasha and Shane are doing laundry downstairs in Ethel's basement, where there are dozens of washers and dryers stacked against the wall. Sasha takes the grocery cart I've hung our clothes on because she wants to use it to hold the helium tank for blowing up balloons. I blow up a few balloons, Sasha and her friends blow up a few balloons, but they keep popping for some un-

known reason. I start wondering what's happening with the balloons and notice a boy using the tank on a single balloon which gets larger and larger until it's the size of small hot air balloon. He finally pulls the balloon away from the helium tank and I remember thinking that the balloon was so huge it would carry him away. The next thing I know, Steve and I are looking up at the sky and there's a white parachute coming down--as it gets closer, I can see two people on the chute--one has skis on and is doing flips. I'm wondering aloud to Steve how this is possible and explicitly say, "This must be a dream--we're dreaming--this is a lucid dream! We're both in the same lucid dream." I waited for Steve to come to the realization that he was dreaming (i.e. the logic was that we're in the same dream because we each put ourselves there, not because I, the dreamer, had constructed this experience). I wanted Steve to write down that this was a dream so we'd remember.

In the meantime, I'm still watching the two boys with the parachute come in for a landing. They landed off behind trees in a distance in a mountain of popcorn, which exploded when they landed. I again say to myself and to Steve that this is a dream--I remark on how stable the environment is--I find it hard to believe. We're in a beautiful lush canyon area--lots of blue-greens and purples, water below--we stop to watch the ocean and a surfer who seems to grow out of a wave. I remember the environment as exceptionally vivid and detailed and satisfying. I "check back" to see if I'm still dreaming--determine that I am, and say to my husband that I'm going to fly a little more as long as I'm lucid. The environment switches to the Southwest and the colors change to mauves, sandstones, etc.

...a creature that looks like a deformed elephant seal comes toward shore. Some guys are trying to capture it. My son and I are watching, spellbound. From behind the creature comes a giant octopus, at least ten feet in diameter. We back away from the water's edge, but it comes right out of the water and at us. It is purple and I can see the lighter colored suctions on the underside of it's raised tentacles. We are trying to back up into a tree. Due to the intense emotion, I become lucid. I tell my son, "Relax, we're dreaming and octopi don't climb trees." Now, more aware, I know my son isn't dreaming with me....

[As the level of lucidity changes in a dream, it is possible to correct an error of thinking a dream character is real.]

I decide to fly and go straight up toward the roof of the warehouse. There's something hanging there; I think it's a representation of a human, art work of some kind. I say, "Are you the teacher?" Then it's a little girl of four or five who's flown up with me but is suddenly scared to fly down. I hold her in my arms and bring her back to safety. I want to make sure she gets home safely and ask her where she lives. She doesn't answer at first and I think she may be confused and overwhelmed. Then she says, "San Jose." "San Jose!" I repeat, wondering how in hell I'm going to get her back there.

The last example above of a lucid dreamer treating a dream character as a real person, in this case, a frightened child, raises an interesting question. If dream characters are based on our expectations, experiences, and biases about people, then our interactions with them can help us illuminate the blueprint we use in approaching others, and possibly even our models of our selves. Therefore, it may not always be the best idea to dismiss dream characters as figments of the dreamer's imagination. They may be valuable representations of facets of your mind. If so, then dream figures are still not "real people," in the sense that they will affect your social situation in waking life, and so do not require adherence to social dictates, but an attitude of respect and curiosity may help you

to discover how you see people and your relationships with them. Once again, the advice is to utilize consciousness to choose the most effective approach.

Several other types of flawed thinking appeared in the lucid dreams reviewed. Some of them may be examples of "functional brain damage" in the REM-sleep state. For example, there were some cases of irrational thought, like believing a firewood log is a god in disguise, or thinking that the dreamer's body is acting out the dream actions. In one case, the dreamer could not add beyond 200, and there were several instances of incorrect recall of waking life conditions (sleeping place and whether something really exists). Yet, the majority of errors fit the description of following unconscious patterns set up early in life to protect our lives and social status. Perhaps this exposé of habits inappropriate to dream life can serve as a guide to oneironauts as they stretch their mind-wings into new realms of experience.

An Hour of Wakefulness Before Morning Naps Makes Lucidity More Likely

By Stephen LaBerge, Leslie Phillips, & Lynne Levitan

Morning naps provide us highly favorable circumstances for inducing lucid dreams. Two important factors are at work here: timing and wakefulness during sleep. (The term "nap" indicates that the target sleep period is immediately preceded by a period of wakefulness; "morning" indicates the relevant time-of-day.) A series of NightLight experiments exploring the relationships between napping, length of sleep, continuity of sleep, biological rhythms, and lucid dreaming, have repeatedly demonstrated a strong relationship between taking morning naps and increased likelihood of lucid dreaming. (1, 2, 3, 4)

Working from the premise that lucid dreaming is associated with increased REM propensity and REM intensity, both of which are typically at or near their peak late in the morning, the first of our nap studies, "The Best Time for Lucid Dreaming," (1) compared the following sleep schedules: a. Taking a two-hour nap two hours after getting up two hours early (i.e., taking a nap at the normal waking time) and b. Taking a two-hour nap starting four hours after getting up two hours early (i.e., taking a nap two hours later than the typical rising time) to assess their relative value in promoting lucid dreams. Overall, lucid dreams were 10 times more likely in the naps than the preceding nights. More lucid dreams per total dreams occurred in the two-hour delayed nap than in the four-hour delayed nap (an average of one lucid dream out of each two dreams versus one lucid dream out of each three dreams, respectively). Although the number of subjects in this study was not large enough for the differences between the two napping conditions to be statistically significant, it was very encouraging that these nap schedules showed much more effect on lucid dreaming than any of our previous studies of lucid dream induction by mental exercises.

Our second nap study, "Get Up Early, Take a Nap, Be Lucid," (2) compared three different sleep schedules, one each night. In the first schedule, Condition A, participants awakened 90 minutes before their normal waking time, stayed up for 90 minutes, and did a special MILD exercise for 10 minutes before falling back to sleep for a 90-minute nap. In the second sleep schedule, Condition B, participants also awakened 90 minutes prior to their normal waking time, but then went right back to sleep after doing the MILD exercise for 10 minutes to finish a "normal" night's rest. In the third sleep schedule, Condition C, subjects slept their complete normal sleep time, woke up and did the MILD exercise, then returned to sleep for 90 extra minutes. In Condition A (delayed nap), 8% of participants had lucid dreams in the night, and 67% in the nap; none of the participants had lucid dreams in the night portion of Condition B ("normal" sleep with MILD), and 33% in the nap; 17% of participants had lucid dreams in the night portion of Condition C (prolonged sleep), and 8% in the nap. In other words, Condition A (which included the delayed nap) was, by far, the sleep schedule most conducive to lucid dreaming, with a full two-thirds of participants recording lucid dreams under these circumstances. The results of this study indicated that there was something about the delayed sleep that greatly improved lucid dreaming ability, as the prolonged sleep in Condition C, which happened in the same time of the morning as the Condition A nap, was not associated with these elevated levels of lucidity.

The value of a period of wakefulness in promoting lucid dreaming has been known since the late 70s when LaBerge noted that certain activities "in the middle of the night" have been observed to

increase the likelihood of lucid dreaming upon a subsequent return to sleep (3). Patricia Garfield, (4) for example, found that, in her case, "sexual intercourse during the middle of the night was often followed by a lucid dream." Scott Sparrow, in contrast, found that early morning meditation favored lucid dreaming (5). Additional anecdotes cited by LaBerge (3) indicated that early morning reading or writing was also favorable. The diversity of these activities suggested that it is not the particular activity, but the alert wakefulness that facilitates lucid dreaming during subsequent sleep. (3)

Following up on this observation, in our third experiment, "The Best Time for Lucid Dreaming: Naps, Mishaps, and Recaps," (6) we planned to study the effect of varying periods of wakefulness before naps (10 minutes versus 90 minutes), but due to an ambiguity in the instructions, many participants did not start their naps at the same time for the two conditions, confounding the impact of varying periods of a.m. wakefulness with changes in the circadian phase. Also, those who were asleep less time probably had less time in REM and, thus, less opportunity for lucid dreams. Despite these complications, we were able to effectively compare the first and second parts of sleep, which again showed a.m. naps to be much better than nights for lucid dreaming.

The fourth in our series of nap studies, reported in NightLight 4.4 (7), compared lucid dreaming frequencies in morning and afternoon naps. The results were clearly in favor of morning naps. Nine of the eleven participants had more lucid dreams in morning naps. Two had the same number of lucid dreams in each napping condition. None had more lucid dreams in the afternoon than the morning. Time asleep, for both nap conditions, was approximately one hour. There were slightly fewer total dreams recalled from afternoon naps, but the difference was not of statistical significance. Hence, it seems that the different times of day must somehow be responsible for the varying levels of lucidity.

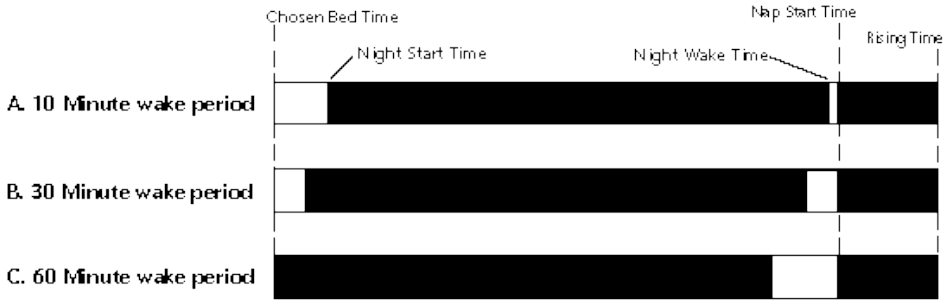
In sum, past nap experiments demonstrate the great impact of morning naps in achieving lucid dreams, but leave questions such as the optimum amounts of sleep and wakefulness prior to the naps largely unanswered. The current study brings us one step closer to determining the ideal conditions for inducing lucid dreams by clarifying the effects of varying periods of wakefulness (10, 30, and 60 minutes) before morning naps.

The Procedure

Participants in the "Wakefulness During the Night: Aiming Towards the Perfect Lucid Dreaming Technique" experiment (8) followed three different sleep schedules, one on each night. In Condition A, they went to bed 50 minutes past their regular bedtime, awoke 10 minutes before their regular rising time, read about lucid dreaming for 10 minutes, then returned to bed for a nap; once back in bed they set their alarm to awaken them in 90 minutes, then practiced a modified MILD exercise for at least 10 minutes or until they fell asleep. In Condition B, they went to bed 30 minutes past their regular bedtime, awoke 30 minutes before their regular rising time, read about lucid dreaming for 30 minutes, then returned to bed for a nap; once back in bed they set their alarm to awaken them in 90 minutes, then practiced a modified MILD exercise for at least 10 minutes or until they fell asleep. In Condition C, participants went to bed at their regular bedtime, awoke 60 minutes before their regular rising time, read about lucid dreaming for 60 minutes, then returned to bed for a nap; once back in bed they set their alarm to awaken them in 90 minutes, then practiced a modified MILD exercise for at least 10 minutes or until they fell asleep. In other words, the three experimental conditions all allowed for the same lengths of time for sleep and napping and held constant the activity to be performed during the period of wakefulness (reading about lucid

dreaming), but varied the amount of morning awake time before the naps. This allowed us to assess what impact varying lengths of wakefulness prior to morning naps might have on lucid dreaming.

Figure 1. Diagram of the three experimental conditions.



Results: Stay Awake Longer

Twenty-two people (12 males and 10 females) submitted acceptable data. (9) Ninety-five percent of them recalled one or more dreams per night. As a measure of their level of skill in achieving lucid dreams we had asked them how many lucid dreams they had recalled within the last six months, and in their best six months of lucid dreaming. Based on the data provided by the group, we would have expected an average of about one lucid dream approximately every seven nights for each participant if they were not involved in the special conditions of this study. Participants averaged one lucid dream every 36 nights during the nighttime portion of this study, and one lucid dream every 11 nights during the Condition A nap. However, dramatically higher rates were found in nap Conditions B and C. On average, participants experienced lucid dreams once every two nights in nap Condition B, and even more (once every 1.6 nights) in nap Condition C.

Participants reported a grand total of 424 dreams during this study--235 (55%) during nights and 189 (46%) during naps. Three of the 235 nighttime dreams (1.3%) were lucid and 50 of the 189 nap dreams (27%) were lucid. In other words, although 55% of the total dreams were reported in the nights, the great majority (94%) of the lucid dreams occurred during naps. Of the 53 lucid dreams, seven were in Condition A (two during nights and five during nap periods following 10 minutes of wakefulness, 20 in Condition B (none during Condition B nights, and 20 in nap periods following 30 minutes of wakefulness), and 26 in Condition C (one in a Condition C night, and by far the highest number of all, 25, during the nap periods following 60 minutes of wakefulness). Nearly half (over 47%) of all lucid dreams from this experiment were reported to have taken place in morning nap periods following 60 minutes of wakefulness. In our current study five times as many participants had lucid dreams in morning naps after 60 minutes of wakefulness compared to naps after only 10 minutes of wakefulness.

Discussion

Holding the other parameters of this study relatively constant allowed us to assess the impact of varying lengths of wakefulness (10, 30, and 60 minutes) on lucid dreaming in a.m. naps. It appears there is something about the increased lengths of wakefulness that somehow better prepares the brain to become lucid in dreams.

Although five lucid dreams were reported in Condition A naps, 20 during Condition B naps, and 25 during Condition C naps, it is significant to note that of five participants in this study who reported lucid dreams in Condition A naps, four actually took at least 15 minutes beyond the minimum 10 minutes of required MILD time (or a total of at least 25 minutes) to fall asleep. Hence, it may be that if these individuals had fallen asleep after only 10 minutes, they may have had even fewer than five lucid dreams during Condition A naps. Also, this may be yet another indication that longer periods of a.m. wakefulness are much more conducive to lucid dreaming.

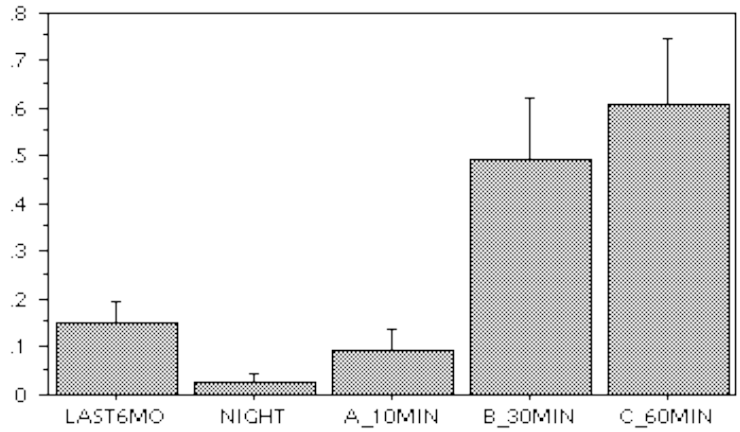


Figure 2. Average frequencies of lucid dreaming in the various experimental conditions. The subjects were significantly more likely to have a lucid dream after 30 or 60 minutes of wakefulness than after 10 minutes.

Note the preceding statement regarding the relationship between increased wakefulness and increased lucid dreaming may have limits not tested in this study. In other words, we would not want to generalize this statement beyond the current findings for the three periods of wakefulness addressed in this study. It could be, for example, that 120 or 180 minutes of wakefulness may be no more effective, or even less effective, than 60 minutes in bringing about the ideal condition for having lucid dreams. This issue will undoubtedly be of interest in future NightLight nap studies.

Conclusion

Getting up an hour early, staying awake for an hour or more reading about lucid dreaming, doing MILD briefly, then taking a morning nap is an excellent means of achieving lucid dreams. This technique is one of the most powerful, promising means of achieving lucidity.

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(9) Twenty-eight people submitted data for this experiment. Six data sets were incomplete (typically missing lucid dream reports) or inconsistent, so results from 22 participants were used in this Research Update.

[From NightLight 7(1), 1995.

Adventures with the NovaDreamer

By Keelin

Although I've been a lucid dreamer since childhood, the thrill of being awake within my dreams has never diminished. Throughout the years of exploration, I've encountered a vast array of "dream-signs" (anomalies within the dream) which can be effective lucidity triggers -- when I manage to catch them. And though I can become lucid without the aid of an external cueing device, using the NovaDreamer adds a pleasurable anticipation and challenge to the night's adventures.

The NovaDreamer is one of the lucid dream induction devices developed by Dr. Stephen LaBerge, founder of the Lucidity Institute. Infrared sensors, positioned above the dreamer's eyes in a comfortable sleep mask, pick up the rapid eye movements that give REM sleep its name, and the device's microprocessor delivers a lucidity cue in the form of certain pre-set patterns of light and sound, (selected by the dreamer from a variety of possible combinations) which enter the dream to encourage lucidity.

There's a certain comfort and advantage to knowing that the NovaDreamer will deliver a definite light-related cue. Whether or not it's recognized, of course, is a different matter. But one of the benefits of utilizing light as a signal is that training to become aware of the cue in dreams can be done while awake. Rehearsing is essential because the NovaDreamer is simply a tool, a provocative nudge from the outside world. It cannot force or guarantee lucidity. Awareness must be cultivated, intended. Since working with the NovaDreamer, I've found it helpful to keep a written notation of reality checks inspired by waking life occassions in which any change of light has caught my attention. Not only has this discipline increased my chances of catching a cue incoporation while dreaming, it has enhanced my enjoyment and awareness in waking life as well.

A frosty, Winter morning. The sun breaks through a darkening sky and suddenly my attention is captivated by a sparkling chandelier lying amongst the folliage before me. It's as if someone had flipped on the light switch. In the next instant, it is transformed into a cascade of slender branches, each one delicately encased in ice. The simple, quiet beauty is so mesmerizing, it takes my breath away! Am I dreaming? Could this be a cue from the NovaDreamer? A reality check declares not this time. Even so, I feel the same rush of joy as at the onset of lucidity in a dream.

Habitual reality checking in waking life pays off in the dream world.

I'm with some friends when the room light begins to flicker. Though I assume there's a logical reason for it, I explain that I have to do a reality check as part of my training to catch NovaDreamer cues. As I examine a digital clock, the numbers begin to transform right before my eyes. My companions look at me like I'm crazy, but I've become lucid and realize they are dream characters.

The NovaDreamer's light cues have appeared in a great variety of forms in my dreams. Incorporations such as blinking traffic lights, flash cameras, lightning and fireworks seem a bit more obvious than geometric patterns in brilliant color, a dozen full moons, neon pink flamingos in sudden flight or the shimmering tail of a mermaid. With the possibilities being limitless, my curiousity remains piqued. I know the cues will appear, but will I be alert enough to recognize them? In one instance, two soft, pulsing lights a short distance away from where I was standing led me to conclude that someone very nearby must be dreaming! It never ceases to amaze me how clever the mind can be when inventing rationalizations for incorporated cues.

A light in the kitchen is blinking off and on. I think someone who knows how the NovaDreamer cues can appear is playing with the switch, trying to get me to do a reality check. I watch a red brick wall illumine and darken a couple of times before realizing it is the cue and I am dreaming!

Sometimes the first few cues in a dream slip by undetected.

While swimming with dolphins, I visualize scooping water with my hands. I think the streaks of bubbles might entertain them. The imagined movement becomes very vivid as my visual field is suddenly filled with bands of shimmering water...

A short while later, though I see a bright flashing within the dreamscape, I fail to become lucid, as my attention is detoured by a totally new scene. I'm with some people from the Lucidity Institute. One of them notices I've fallen asleep and makes a little alarm noise. I "wake" slowly (still within the frame dream), to the apparent amusement of those nearby...

Again there is a bright flash, but this time I recognize the cue and attain lucidity. Spinning stablizes my sense of dreambody and soon another scene emerges. I fly easily through walls and window glass, then swoop low to shadow the course of a clear, meandering river.

As illustrated above, when the cue does not incorporate in disguise (e.g., flashes of light fill the entire visual field as compared to cues which blend well into the dream scenario), it can disrupt the current scene. Spinning and other techniques that actively engage the dreambody encourage the continuation of the dreamstate and help stablize lucidity. Since false awakenings can be common in these situations, reality checks become all the more important. This is where the Reality Testing Button on the sleep mask can be especially helpful. Electronic machines are notorious for misbehaving in dreams, but the NovaDreamer takes full advantage of this quirky tendency. Although the following example does not include a false awakening, it demonstrates this exceptional feature.

Lying in a bed on the beach, I'm wearing the NovaDreamer and trying to get to sleep in order to do a dream experiment. Loud music is coming from an apartment next to a cafe situated on the cliff above. I climb up and enter the cafe through a window, scrambling across a table at which some people are dining. The partiers next door are oblivious to my shouting at them to turn down their music, so I return to bed. Thinking I'm awake, I press the Reality Testing Button. When there is no corresponding flash, I realize I'm dreaming!

If the cue leads to true awakening, this can be a perfect opportunity to attempt a wake-initiated lucid dream.

The ceramics studio appears to have been drastically rearranged and expanded to include other arts and crafts programs. A bright light flashes repeatedly from a nearby area. I assume the new curriculum now includes photography and that someone is using a flash camera. Then I awaken and realize it was the cue, so I lie very still and visualize spinning. A new scene emerges in which I am standing infront of a simple wooden door. Knowing that I'm dreaming, I tell myself that the ceramic studio is on the other side, turn the door knob and re-enter the previous dream scene.

Awareness and resolve can increase throughout the night. In the first dream, one particular evening, the cue appeared as flickering room light. In the second dream, it was a candle flame that refused to be extinguished. Finally, in the third dream:

A man sets a large portfolio on the floor so that it opens like a standing book. After turning a few pages, he demonstrates a row of flip-up windows. He snaps each one up quickly, revealing bright,

red squares beneath. For some reason, I feel exceptionally tired and decide to recline on the futon where I've been sitting during the presentation. Casually reflecting on the red squares, I suddenly realize this could have been a cue from the NovaDreamer! Immediately, I become lucid and proceed to carry out an experiment I've been wanting to try.

More like a spectrum of awareness than a fixed state, lucidity can waver dramatically within dreams. Another advantage the NovaDreamer offers is that it continues to repeat the cue every few minutes during a REM cycle.

I'm cavorting in the air, thoroughly enjoying the awareness of dreaming, when I notice a sparkling, rainbow-colored fish flying a short distance away. Fascinated, I gently capture it in my hands. It flutters and buzzes, creating a slight vibratory sensation. Its effervescent radiance becomes a pulsing white light which I recognize as the NovaDreamer, cueing to remind me that I'm still dreaming.

When I first began using the NovaDreamer, I was very sensitive to the cue and kept the brightness factor set relatively low. As the years have passed, I've become more conditioned to the light and achieve better results with a higher setting. In working with the adjustable cue settings in Mode One, the acronym "NIRTS" helps me remember the dial number/setting relationships, where N=number of cues, I=intensity, R=rate, T=type and S=sensitivity. It has taken some experimentation to find my optimum, personal settings and I will probably need to continue making slight adjustments as time goes by. The mask, which didn't take long to get accustomed to, is also convenient for sleeping in past sunrise (perfect for those nap experiments) or whenever my companion chooses to read in the middle of the night.

Lucid dreaming is a magnetic mystery to which I am passionately attracted. Throughout the years, I have found countless opportunities to apply what I've learned specifically from lucid dreaming to my waking life, particularly in the areas of creative decision making and alternative thinking. It is this blending of dream and waking worlds that continues to intrigue and inspire me. By observing how things manifest in lucid dreams, I can better comprehend how my impression of waking reality corresponds to my perception, expectations, intentions and actions. Now, when I am confronted with a challenging situation (and when I am living lucidly) I can ask, "If this were a dream, what would I do?" It is personally empowering to realize that getting sucked into the on-going drama is optional! Of course, this reflective state takes practice, and more often than not, I am seduced into habitual reaction as opposed to more mindful response. Still, that awareness, be it in the waking or dream world, is worth striving for. Working with the NovaDreamer helps keep me focused on this intention by reminding me of the magic, wonder, humor and lightness that can be found in both realities.

A patch of brilliant sunlight catches my eye. I reach for it, pulling myself towards its radiance...

About the Author

Keelin is a long-time friend and member of the Lucidity Institute. Keelin freely admits to an unrestrained passion for lucid dreaming that borders on the obsessive. If addressed, any time of day or night, she is quite likely to respond: "I'd rather be lucid dreaming!"

[From NightLight 7(3-4), 1995.

Diary from Lucid Dream Camp

By Keelin

When I heard the Lucidity Institute was offering a five-day residential lucid dream training program entitled "Consciousness: Dreaming and Waking", I was intrigued. The program was to be a special fund-raiser supporting scientific research on lucid dreaming, an obviously worthwhile cause. Moreover, the workshop sounded enticing with presentations by Dr. Stephen LaBerge, mandatory naps and evening dream movies. Mandatory naps? I read it twice just to be sure I wasn't dreaming. Then I packed my bags.

Thursday, August 25, 1995

En route to the workshop, I warmed up with a couple of reality checks: In a market, a package labeled "Chocolate Dreams" catches my sweet-tooth eye, but a reality test convinces me the calories would be all too real, so I resist the temptation.

A bus driver announces that the fare-collecting machine is broken. Everyone gets a free ride! Passengers are so elated that even strangers begin chatting with each other as if a holiday has just been declared. I suspect that only dream characters would behave in such a fashion, but the dollar in my hand doesn't morph into a hundred, so I conclude this is just waking reality.

That afternoon, nineteen participants, along with three staff members from the Lucidity Institute, arrived at Casa Italiana on the campus of Stanford University. During the school year, the tree-shaded, three-story house serves as a dormitory for students who wish to immerse themselves in Italian studies. Here they can indulge in the country's cuisine, practice the native language and dream Italian dreams. For this occasion, however, Casa Italiana was appropriately renamed "Casa Lucida". Here we would dine on creative concoctions dreamed up by Lucidity Institute staff member Electra Shiner, become more fluent in the language of nocturnal adventures, and (hopefully) dream lucid dreams.

As dreamers began to trickle in, conversations sprouted spontaneously and there was a growing sense of excited anticipation. Far from familiar surroundings, but in the company of admitted oneironauts, I felt immediately at home. Shelli Panspinelli, a kinetic sprite with contagious enthusiasm, greeted everyone with a warm welcome, passed out schedules and camp t-shirts and helped us get settled with our accommodations. A short while later, we assembled for introductions and the opening presentation.

Stephen LaBerge initiated the introductions, inviting us to describe our interests in lucid dreaming and our hopes and intentions in attending the workshop. The eight women and eleven men in attendance, represented a variety of occupations and ages, including a woman in her seventies and a boy of fourteen years. High on everyone's list was a desire for increased lucid dreaming as well as a better understanding of how to navigate within that world.

The first of Stephen's articulate presentations focused on the basics of lucid dreaming, including suggestions for improving dream recall and an explanation of the MILD technique. MILD, an acronym for Mnemonic Induction of Lucid Dreams, is based on one's ability to carry out pre-set intentions (such as recognizing that one is dreaming), through applied mental effort. Since most of us go

through our daily lives functioning on automatic, we're not accustomed to maintaining the level of awareness necessary for lucid dreaming. To help us practice doing so, we would play two games throughout the workshop: I Remember and The Doors of Perception.

In I Remember, whenever we were handed something, we were to say "I remember", or acknowledge the action in some visibly apparent way. If we forgot to do so, we were "rewarded" with a shiny star adhered to our name tag. The idea behind this exercise is that remembering to do something while dreaming requires the same mental performance as in waking. Not only can practice while awake improve this skill, there's also the possibility that the habit will carry over into dreaming. Indeed, one week after the workshop ended, Stephen (who had escaped without acquiring a single star) dreamed he was being handed an item. Asking himself if the game was still being played, he realized the workshop was over, concluded he was dreaming, and stepped into the air....

The Doors of Perception required that we touch each doorframe as we passed through. The concept behind this exercise, is to increase awareness and to begin a new habit which can be carried over into dreams. Each time, each doorway. So simple. Yet within minutes, I discovered what a formidable challenge this can be.

At this point, a provocative question was posed: Could we be dreaming at that very moment? Come to think of it, I had dreamt of being at Dream Camp at least twice before arriving that day. After describing a variety of determining techniques, Stephen stressed the importance of making reality testing habitual and encouraged us to keep a vigilant eye out for dream-like events in waking life which would help prepare us to recognize the anomalies in our dreams.

We were then given detailed instructions regarding those "mandatory" naps. For the past few years, the Lucidity Institute has been conducting research in the lab and through at-home experiments featured in their newsletter NightLight to determine the sleep schedule most conducive for lucid dreaming. So far, their studies have shown that getting up an hour early, staying awake for an hour or more and then returning to sleep is one of the most promising techniques for achieving lucidity. Arrangements were made so that dreamers could be awakened at the optimal times.

The first ended with a dream-like bedtime tale entitled "The Story of Mushkil Gusha", followed by a series of short films that were as bizarre as any dreams I've ever conjured on my own. Un Chien Andalou, Rapid Eye Movements and None Shall Sleep (and I'm sure no one did!) left me wondering if I'd already crossed the fine line into dreaming.

Friday

I'm consciously aware of the hypnogogic beginning of a dream. The image of a sun-dappled beach takes on vividness, but I rise to full wakefulness before the scene has a chance to develop into a full-blown dream. Still, I'm excited to have been at the doorway of a lucid dream.

In the morning, we gathered to share adventures of the night, celebrating lucid accomplishments, commiserating and rolling our eyes over missed cues, vowing to do more reality checks and to remember to remember. Having acquired my first star early that morning, I was determined not to start a collection. In my room I'd been putting in some extra practice, reaching out my hand, imagining that I was being handed something. Still, when the real action was taking place, how easy it was to become distracted! Obviously, this exercise was about more than developing a habit. It was truly about remaining Aware.

To help us develop the habit of reality checking during the day, Shelli distributed a "Programmable Electronic State Tester" to each dreamer. And, while doing so, handed out a few more stars to those who had already forgotten to remember. The PEST, about the size of a small beeper, uses vibration, beeps or flashes (or combination of these) to remind the wearer to do a state test each time the signal is given. Establishing this habit in waking life carries over into dream life, thereby increasing the chances of becoming lucid.

Stephen then described several techniques which would allow one to enter a dream directly from the waking state without ever losing consciousness. Wake Initiated Lucid Dreams (WILDs) can be the most exciting and bizarre of dream experiences, as the physiological conditions that give rise to them may also produce such sensations as sleep paralysis, vibrations, buzzing sounds or the body dissolving. Although these sensations can initially be startling, familiarity soon leads to recognizing them as a prelude to lucid dreaming. In the afternoon, we focused on various methods of dream control, including techniques for prolonging and re-entering dreams, such as spinning or rubbing one's dream hands as the dream scene fades. Any activity that engages the sense of dreambody within the fading dream can act as a stabilizer. The reason for this is that it contradicts the rising physical sensations of the waking body and pulls the dreamer back into the dream.

Stephen elucidated the difference between control over dream characters or elements verses control over one's own responses within the dream. Citing nightmares as an example, Stephen emphasized the point that our feelings in response to dream events are very real. Even recognizing that we are in an illusory world may not automatically dissolve our fears. And although we may experience dreams in which control over terrifying elements is possible, it is unlikely that such means would be available to us in waking reality. This is why learning to practice Self-control within the dream is far more applicable to our waking lives than any magical manipulations of dream events that we might conjure.

That evening, Stephen's slide show presentation on the history and science of lucid dreaming and the development of the DreamLight offered insight into the on-going research which is helping to map the world of dreaming. The results of experiments comparing waking to dreamed activities, such as respiration, singing, counting and dream sex were particularly interesting. The presentation elicited a lively discussion, after which we settled down for a viewing of Luis Bunuel's surrealistic film That Obscure Object of Desire. Despite being warned there would be something unusual about the film, most of us missed the anomaly. It served as a potent reminder of how easily we accept without question what appears as "reality" -- in movies as well as in our waking lives.

Saturday

Standing with a friend in shallow water, I feel the seductive pull of a wild ocean, each wave rushing in, retreating. Then tumbling, almost weightless, filled with joy and movement, salty taste of seawater on my lips. Though not yet lucid, there is a feeling of being on the very edge of dream awareness, a step further than last night's beginnings.

During the morning's dream sharing, we had an extraordinary opportunity to witness an episode of "lucid living" as Shelli related a disturbing dream from the night before. In her nightmare, a dream character appearing as Stephen had announced, in front of all the workshop participants, that she would not be receiving a diploma from Lucid Dream Camp. He had proclaimed that she didn't have what it takes to be a lucid dreamer!

It was apparent that this dream had been extremely disturbing to Shelli, and I suspect we all could relate at some level to her question of confidence. Yet it appeared that Shelli was reacting to the dream as if it were true. I felt torn between compassion and the realization that, in actuality, there was no basis to support the scenario that haunted her. Fighting back tears, Shelli's tone had bordered on confrontational. How could "Stephen" have done this to her! The room filled with quiet tension as we awaited his response.

Without patronizing or slipping into the emotional drama of the situation, Stephen asked Shelli to tell the dream once again, but to stop at whatever points might be considered as Dreamsigns. Stephen's gentle calmness offered an impressive demonstration of how the same skills that allow us to become lucid in our dreams can also serve us well during challenging moments in waking life.

Still shaken by the vivid experience, Shelli retold her dream. With Stephen's careful guidance, she quickly came to recognize two essential anomalies: one, that the behavior of the character who appeared as Stephen in the dream did not match that of the waking world Stephen; and two, that she'd recently had a series of lucid dreams. With this reflection, she was able to realize the absurdity of the scenario and to respond intentionally to the deeper issues which it brought up for her.

The mood lightened as discussion then turned to the variety of exciting adventures lucid dreaming can provide. In comparing goals for our next lucid dreams, flying (sans aircraft, of course) appeared to be the favored activity, but personal lists were extended to include new ideas such as hot tubs, massage and frolicking with dolphins. Novice lucid dreamers can attest to the frustration of waking unintentionally at the onset of lucidity. Having a pre-set goal, especially one which requires focused interaction between the dreambody and the scene or other characters, can have a stabilizing effect.

That afternoon, we took a look at the nature of Perception and the essential difference between waking and dreaming consciousness. As Stephen explained it, while awake, our brains rely primarily on sensory input and, to a somewhat lesser degree, past experience and motivation to form a model of our world. Because of biological evolution, this waking perception is very tightly constrained by the physical world. While dreaming, our brains become activated in order to keep the system running more easily (so we don't have to jump-start our brains every morning).

Some members of the group strongly objected to Stephen's suggestion that biological survival needs were the original source of dreaming in the human species. Actually, in fact, one member of the group, Ivan, made it his role to respond to almost everything Stephen said with "I disagree!" making for much spirited discussion. In any case, some found it unacceptable that such a cherished and beautiful aspect of ourselves was relegated to the position of a "mere" biological survival mechanism. Attempting to bridge the gap between the "hard, cold" reality of biological survival, verses the "soft, warm" reality of dream consciousness, one of our more philosophically inclined members suggested the following analogy: computers were originally developed by the defense department for military purposes but we can, if we choose, use them to create beautiful works of art.

Moving on to explain more about the difference between waking and dreaming consciousness, Stephen pointed out that, while sleeping we continue to model the world in the same way as when we are awake, but with the major difference that, while sleeping, our physical bodies are virtually paralyzed to keep us from acting out our dreams. But while asleep, with no sensory input to contradict the model built by our dreaming minds, the dream world we envision is motivated solely by our past experience, desires and fears. Understanding this fact helps explain some of the bizarreness of dreams. We often get what we expect in dreams (gravity, for example) because that is our experience of the world, a recurrent part of our daily experience.

To help clarify these concepts and to demonstrate the fact that we're more likely to perceive the familiar than the unfamiliar, we engaged in a few auditory and visual exercises. The auditory exercise (a pre-recorded tape) surprised everyone by demonstrating that our perceptions of supposedly "objective" reality are actually highly subject to distortion from various internal factors such as expectations, attitudes and prejudices. After that shock to our egos, a series of optical, Escher-like illusions challenged us to shift visual focus in order to observe other possible interpretations.

During the afternoon break, a small band of NovaDreamer enthusiasts gathered beneath the trees in front of Casa Lucida to share their experiences of working with the induction device. Developed by Dr. LaBerge, the NovaDreamer uses infrared sensors, positioned above the dreamer's eyes in a comfortable sleep mask to detect the rapid eye movements that indicate dreaming. The device's microprocessor then delivers a cue in the form of pre-set patterns of light and sound. The cue (selected by the dreamer from a variety of possible combinations), enters the dream to encourage lucidity. Having worked with the NovaDreamer for a few years, I'm always fascinated to hear how other dreamers have incorporated the cue into their dreams. Meteor showers, fireflies or the twinkle of an eye are all suspect to those of us who work with this clever induction device. As we discussed adventures and cue setting preferences, a brilliant light suddenly caused me to squint. It was just the kind of light that might be a cue in disguise! In this case, however, a quick reality check determined it to be only the sun reflecting off the window of a passing car.

Later that evening we examined the bizarre sensations of Sleep Paralysis and Out of Body Experiences which fall within the spectrum of lucid dreaming adventures. Well prepared for anything the coming night would now offer, we ended with the compelling film Jacob's Ladder, which vividly portrays nightmares, daymares, and the thinning line between.

Sunday

...in a small, cluttered shop, I discover a bowl of chocolate bears. Not the customary teddybear shapes, but presumably fashioned from some realistic, antique mold. I'm simply gazing at them when suddenly it dawns on me that this is a dream! (Chocolate dreams?) I'm so thrilled, I delightedly indulge in two of them without an ounce of caloric concern...

Amusing tales of missed cues and near lucidity highlighted the morning's dream sharing. One dreamer considered spinning when her dream began to fade, but was hindered by the huge skirt of her wedding gown. In my own dreams, I'd carried a pillow through a populated area until it grew bigger than the bed for which it was intended.

It was interesting to note how animated people became when they spoke of reaching lucidity in their dreams. One woman recounted a touching lucid dream cued by her deceased father, while another dreamer inspired us all with the two WILDs he'd experienced during his morning nap.

For the next session, Stephen suggested we select a nightmare to work with or at least a dream that hadn't ended to our liking. We sat awhile in silence, each privately reviewing our chosen dream. Then Stephen encouraged us to imagine becoming lucid in the dream and to invent an alternative ending. After some of the participants shared the new versions of their dreams, one of the women posed the very disturbing question: what if your dream monster isn't some bizarre-looking alien creature, but is actually based on a person from waking life?

What Stephen offered in response was somehow hauntingly familiar, as if it echoed my own inner voice. But hearing it anew and in this setting, I heard it differently. What struck me most was the

idea that, over time, an image could take on something of its own life, but that such an image holds only the power with which we imbue it. I realized it would be tremendously beneficial if I could shift from my familiar emotional reaction of fear to curiosity and therefore have the courage to investigate whatever might exist beneath the image. I vowed to do so in my next dream encounter. [A few weeks after the workshop, I did indeed tear away the mask of my dream monster only to find it ripping like soft, moist clay and revealing nothing but a vast, dark void beneath.]

That afternoon, we took a stroll across the quiet Stanford campus (reminding each other to touch all the doorways we encountered) to tour the laboratory where the research for which the program was raising funds is done.

We shared a comfortable camaraderie as we gathered for the last supper of Lucid Dream Camp. Rachel had prepared yet another delicious and colorful feast. This one even included a side order reality check of attractively presented dog biscuits! Mealtimes were always boisterous and casual, a chance to carry on discussions inspired by the thought-provoking sessions, and, of course, an opportunity to give or get a star or two. One of the women, who had run out of room on her nametag, displayed a lovely constellation on her forehead.

In our final evening session, we turned our attention to the topic of transpersonal experiences. Stephen reminded us that the self perceived in most of our dreams is only part of the whole Self. One way to approach the mystical type of dream journey is to ask for the wiser or deeper self to be revealed, and to be open to whatever comes of this request. This can lead to profound and deeply moving experiences.

As a guest of honor, Dr. Fariba Bogzaran had joined us for the final evening's discussion. At Stephen's request, she agreed to tell us about her research on seeking the Divine through lucid dreaming. As she began to speak in her soft, melodic voice, I sensed something very odd was happening. I couldn't understand a single word she was saying (and I was sitting right next to her)! Across the room, heads tilted and several faces took on quizzical expressions. The room grew very quiet with the concentrated effort of trying to make sense of this situation. It suddenly dawned on us that Fariba was tweaking our sense of reality by speaking in Farsi! Ivan, in good humored self-parody, broke the general silence with -- "I disagree!" and everyone burst into laughter.

Fariba began again (in English) to describe how people's dream experiences of seeking the Divine were affected by their expectations and their methods of approach. Her study showed that those who envisioned the Divine in the form of a personified deity usually encountered a representation that matched their pre-conceived images. Others, who conceived a Divinity of a less personal nature, tended to dream accordingly. While those who actively "sought the highest" often found the god they expected, dreamers who adopted a more passive approach, "surrendering to Divine Will", had more unexpected results.

I feel very fortunate to have been a participant in Fariba's study. The dream I experienced years ago as a result of seeking the Divine still moves me deeply. Having become lucid, I had decided to fly up into the starry night to catch a glimpse of the moon. When I found myself floating in the midst of a vast, limitless darkness that was at the same time brilliant with countless stars, I became ecstatic. I hovered there hearing the "aliveness" of that place with my whole being. Then I began to move even further out into space until stars, planets and entire solar systems, spinning harmoniously, faded into the distance. Again I paused to appreciate the sense of eternal energy everywhere. It seemed a perfect setting to ask the question: May I know the meaning of the Universe? The answer came in a wholly unexpected form. Something began to emerge from the distant darkness. It

looked like some kind of living molecular model or mathematical equation -- an extremely complex, three-dimensional network of fine lines and symbols glowing in neon orange. It continued to unfold itself, multiplying, constantly changing, filling up the Universe with increasingly complex structures and interrelationships until it literally went beyond me.

I awoke with wonder, excitement and delight, and a renewed and deep respect for the awe and splendor of the Universe. It was as if I had glimpsed the invisible relationships connecting all things -- the micro molecular level superimposed over the infinity of the Universe. This dream has led me to believe that in some way, I, too, am a unique and essential part of whatever is going on here -- the Divine is within as well as without.

Throughout the evening's presentation, the faint sound of Rachel's ethereal, dream-like singing drifted in from the kitchen -- a most fitting accompaniment to the evening's topic. Appropriately, the last night's featured film was Peter Weir's classic The Last Wave. On the surface, it appears to be about a lawyer who, while defending a group of aborigines, finds himself slipping into Dreamtime. Although I'd rented this movie several years ago, I had missed much of the symbolic undertones, which Stephen later pointed out for us. Still, it may take another viewing to appreciate it in its depth.

Monday

After sharing our morning's dreams and personal reflections on the program, Stephen helped manifest a new ending to Shelli's earlier nightmare by presenting her with her very own Lucid Dreamer Diploma!

We said good-bye to new friends, promising to meet again, perhaps next summer or else in dreamland. With the workshop coming to a close, I felt time had flown. Devoting those few days to the focused intention of lucid dreaming had a revitalizing effect.

Stephen's thorough presentations and the stimulating, supportive atmosphere of Lucid Dream Camp had provided a perfect setting for refining skills and techniques and for further intensifying my insatiable desire for lucid dreaming.

There's a certain feeling that comes with waking from an especially wonderful dream. And the more profound that dream has been, the more I long to linger there, to embrace that feeling, to hold the fading images until they become forever etched in my memory. These were my thoughts as I reluctantly boarded the airplane which would transport me from the moving experience of the workshop back to the familiar routine of life at home.

I dawdled, letting other passengers go ahead, knowing that once I was back in Portland, the last few days would inevitably fade -- like a dream. After a final reality check, I handed over my ticket, and in passing, gave the doorway a light, nostalgic tap, and flew off into the sky.

About the Author

Keelin is a long-time friend and member of the Lucidity Institute. It doesn't take a precognitive dreamer to guess where she'll be next Summer... Lucid Dreaming Camp!

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Prolonging Lucid Dreams

By Stephen LaBerge

People frequently awaken from lucid dreams sooner than they would like. Nothing is more frustrating than to invest hours or weeks of effort aiming at the goal of having a lucid dream, and then to wake up within seconds of becoming lucid. Fortunately, however, there are several effective techniques that allow beginners and experts alike to prevent premature awakenings from lucid dreams.

The earliest method for stabilizing lucid dreams was described by Harold von Moers-Messmer in 1938. Moers-Messmer, a German physician, was one of the handful of researchers who personally investigated lucid dreaming in the first half of the 20th century. He was the first to propose the technique of looking at the ground in order to stabilize the dream. [1]

The idea of focusing on something in the dream in order to prevent awakening has independently occurred to several other lucid dreamers. One of these is G. Scott Sparrow, a clinical psychologist and author of the classic personal account, Lucid Dreaming: Dawning Of The Clear Light. [2] Sparrow discusses Carlos Castaneda's famous technique [3] of looking at his hands while dreaming to induce and stabilize lucid dreams and argues that the dreamer's body provides one of the most unchanging elements in the dream, which can help to stabilize the dreamer's otherwise feeble identity in the face of a rapidly changing dream. However, as he points out, the body isn't the only relatively stable reference point in the dream: another is the ground beneath the dreamer's feet. Sparrow uses this idea in this example of one of his own lucid dreams:

"...I walk on down the street. It is night; and as I look up at the sky I am astounded by the clarity of the stars. They seem so close. At this point I become lucid. The dream 'shakes' momentarily. Immediately I look down at the ground and concentrate on solidifying the image and remaining in the dreamscape. Then I realize that if I turn my attention to the pole star above my head, the dream image will further stabilize itself. I do this; until gradually the clarity of the stars returns in its fullness." [4]

A problem with using vision to stabilize a lucid dream is the fact that when a dream ends, the visual sense fades first. Other senses may persist longer, with touch being among the last to go. The first sign that a lucid dream is about to end is usually a loss of color and realism in visual imagery. The dream may lose visual detail and begin to take on a cartoon-like or washed-out appearance. This may all happen very fast; within a few seconds, the dream can fade to black, leaving nothing visual to focus on! For this reason, one might speculate that focus on sensory modalities other than vision may be more useful to stabilize dreams. As it turns out, one would be right.

Dream Spinning

In December, 1978 I had the good fortune to discover a highly effective technique to prevent awakenings and produce new lucid dream scenes. I started by reasoning (mistakenly but as it happens, felix culpa!) that since dream actions have corresponding physical effects, relaxing my dream body might inhibit awakening by lowering muscle tension in my physical body. The next time I was dreaming lucidly, I tested the idea. As the dream began to fade, I relaxed completely, dropping to the dream floor. However, contrary to my intention, I seemed to awaken. But, a few minutes later be-

came clear that I had actually only dreamed of awakening. I repeated the experiment many times and the effect was consistent--I would remain in the dream state by dreaming of waking up. However, my experiences suggested that the essential element was not the attempted relaxation but the sensation of movement. In subsequent lucid dreams, I tested a variety of dream movements and found both falling backward and spinning in the dream to be especially effective in producing lucid dreams of awakening (and, of course, thereby preventing premature awakening).

Out of the one hundred lucid dreams in the last six months of the record in my doctoral dissertation, I used the spinning technique in forty percent. New dream scenes resulted in eighty-five percent of these cases. Lucid consciousness persisted in ninety-seven percent of the new dreams. For comparison, during the six months before I developed the technique, in over a third of my lucid dreams I woke almost immediately after becoming lucid and certainly most ended before I was ready.

In the summer, 1989 issue of NightLight we first attempted to determine the general effectiveness of spinning in stabilizing lucid dreams. The results derived from this study were promising, but unfortunately, statistically inconclusive due to too few subjects completing the experiment. There was a trend for lucid dreams to last longer following spinning compared with a control condition.

As an aside, it is worth noting that while in my experience with the spinning technique, the new dream scene almost always closely resembled my bedroom, this was not the case for others. For instance, one lucid dreamer found herself arriving at a dream scene other than her bedroom in five out of the eleven times she used the spinning technique. These results suggest that spinning could be used to produce transitions to any dream scene the lucid dreamer expects. In my own case, it appears that my almost exclusive production of bedroom dreams may be an accident of the circumstances in which I discovered the technique.

How Does Spinning Work?

Why should dream spinning decrease the likelihood of awakening? Several factors are probably involved. One of these may be neurophysiological. Information about head and body movement, monitored by the vestibular system of the inner ear (which helps you to keep your balance), is closely integrated with visual information by the brain to produce an optimally stable picture of the world. Because of this integration of information, the world doesn't appear to move whenever you move your head, even though the image of the world on your retina moves.

Since the sensations of movement during dream spinning are as vivid as those during actual physical movements, it is likely that the same brain systems are activated to a similar degree in both cases. An intriguing possibility is that the spinning technique, by stimulating the system of the brain that integrates vestibular activity detected in the middle ear, facilitates the activity of the nearby components of the REM- sleep system. Neuroscientists have obtained evidence of the involvement of the vestibular system in the production of the rapid-eye-movement bursts in REM sleep. [5]

Another possible reason why spinning may help postpone awakening comes from the fact that when you imagine perceiving something with one sense, your sensitivity to external stimulation of that sense decreases. Moreover, and this is probably the most important factor, if the brain is fully engaged in producing the vivid, internally generated sensory experience of spinning, it will be more difficult for it to construct a contradictory sensation (i.e., lying motionless in bed) based on external sensory input. When presented with two contradictory interpretations of the state of our body or the world, our consciousness chooses one or the other, but not both models.

If this is the major reason why spinning helps to prevent awakening, one can readily think of other techniques that should work with similar effectiveness. For example, if you rub your dream hands together as the dream is fading, as long as you are experiencing the sensation of rubbing hands, you cannot experience the contradictory lack of sensation that you would need to feel to wake up and perceive the actual condition of your hands. The experiment in NightLight 7.1 was designed to test this idea and to collect additional evidence on the effectiveness of the spinning technique.

The Experiment

Lucidity Institute members were invited to compare each of the following three "techniques for prolonging lucid dreams." (In fact, one technique--"going with the flow"--was intended as a control.)

A. Spinning When in a lucid dream and the dream began to fade, while they still felt their dream body, they were to spin around like a top, as rapidly as possible. Beginning in a vertical or standing position, they were to turn around on a point with their arms outstretched. It was indicated that it is important to experience a vivid sense of movement. They were to continue to spin until they were in a vivid dream scene, or awake. They were instructed to repeat to themselves over and over while spinning, "The next scene will be a dream."

B. Going with the Flow When subjects were in a lucid dream and the dream began to fade, they were to persist in doing whatever they were doing in the dream before it started to fade, ignoring the fact that the dream was fading. Also, they were to repeat to themselves while carrying on with their dream activity, "The next scene will be a dream."

C. Rubbing Hands Together When subjects were in a lucid dream and the dream began to fade, while they still felt their dream body, they were to vigorously rub their (dream) hands together. They were informed it was important to experience a vivid sense of movement and friction. Participants were to continue to rub their hands until they found themselves in a vivid dream scene, or awaken completely. Also, they were to repeat to themselves over and over while rubbing their hands, "The next scene will be a dream."

Subjects were instructed to try the above three techniques once each, in an order determined by the first letter of their last name.

Several times each day, until their next lucid dream, subjects were to rehearse the technique they were to try next. While awake and pretending they were in a dream, they were to follow the instructions for the technique. Subjects were to repeat to themselves during the practice, as they would in the dream, "The next scene will be a dream." Next, they were to follow the instructions for the respective technique:

* SPINNING: Imagine you are in a lucid dream and it is fading. Then actually spin around, as you will in the dream.

* GOING WITH THE FLOW: Imagine you are in a lucid dream and it is fading. Then continue to do what you are already doing while remaining aware that you are dreaming.

* RUBBING YOUR HANDS: Imagine you are in a lucid dream and it is fading. Then vigorously rub your hands together, as you will in the dream.

In their next lucid dream, subjects were to do whatever they wanted to do, but as soon as they noticed the dream fading, attempt the technique they were scheduled to test. They were cautioned not to wait until they were already awake, and to be sure to persist with the technique until either they were in a vivid dream or completely awake. When they believed they had awakened, they were not to move, and to continue doing the technique in their mind for about 60 seconds. This step was recommended because some people have reported returning to the dream state after having fully awakened if they persisted with practicing the technique in their imaginations. If at this point, subjects felt as though actually awake, they were to be sure to use a reality test to check carefully to make sure they were not still dreaming, to prevent false awakenings.

When subjects actually awoke, they were to estimate how much time passed (in seconds) from when they started the dream-prolonging technique until they awakened or lost lucidity. Then, they were to immediately answer the questions on the Report Form about their experience and to write out complete reports of the lucid dreams.

Subjects also filled out a short questionnaire on their dream recall and lucid dreaming ability which they sent in with the rest of their reports after they completed all three conditions of the experiment.

Results

Thirty-four subjects turned in data. However, not all subjects were able to try all three conditions. Eighty percent tried rubbing, 68% spinning, and 65% going with the flow. Some subjects failed to turn in lucid dream reports or otherwise failed to follow instructions. Only eighteen subjects (53%) tried all three conditions of the experiment correctly.

The lucid dream reports were scored by two independent judges. For each report, judges evaluated whether or not the dream appeared to be prolonged following the spin, flow, or rub technique. If a subject had done more than one technique, the two or three reports were ranked according to the judge's estimate of the relative effectiveness of the different techniques for each subject. Reports which the two judges scored differently were scored by a third judge, using a majority rule to resolve discrepancies.

Both the spinning and rubbing techniques were significantly more likely to be judged as successful in prolonging the dream compared with the going with the flow (control) technique. The same was true of the rank ordering analysis. Only 33% of the flow technique lucid dreams were prolonged, compared with 90% of the rubbing and 96% of the spinning lucid dreams.

The following report illustrates a dream judged to have been successfully prolonged by spinning:

... at that point, the oddness of this super-calculator prompted me to say aloud, "I think this is a dream!" And so it was. However the calculator started to fade and de-materialize, and as it did, so did the dream environment. Immediately I remembered to do the spinning-top experiment.

As everything around me turned to blackness--no visual content whatsoever--I started to spin round and say, "The next scene will be a dream" ... I was astonished to find a hole of brightness opening up... the bright hole literally appeared as a break in the black clouds around me, as if the sun were breaking through. I could see the branches of a tree through the hole. As I continued spinning (and it's strange that even though I was spinning round, my sight of the hole was unbro-

ken), I seemed to pull myself towards and through the hole into the countryside of the next lucid dream scene...

The following is an example of a dream judged to have been successfully prolonged by hand rubbing:

I am walking through a beautiful forest. Suddenly I realize I am dreaming. I guess the excitement begins to wake me, so I remember its time for the rubbing hands experiment. I drop a towel I hadn't realized I was carrying, and began to vigorously rub my hands together. I feel my hands rubbing together, experiencing warmth from the friction... My dream stabilizes! I am so happy, I decide to keep walking and explore my beautiful dream forest...

Overall, the odds in favor of continuing the lucid dream were about 22 to 1 after spinning, 13 to 1 after rubbing, and 1 to 2 after going with the flow. That makes the relative odds favoring spinning over going with the flow 48 to 1, and for rubbing over going with the flow, 27 to 1.

Discussion

The results of this experiment seem very clear: both the spinning and rubbing techniques are effective means of prolonging lucid dreams. The fact that the rubbing technique worked as well as it was predicted to supports the theory behind the prediction: that interaction and sensory experience in the dream inconsistent with perception of the state of the body in bed will suppress awakening.

Although the spinning technique was somewhat more effective (relative odds 1.8 to 1 favoring spinning over rubbing) than the rubbing technique, the difference in effectiveness was not statistically significant with this relatively small sample size. Matters for future research to decide are whether spinning has any of the special effectiveness beyond what is explained by the sensory inconsistency theory and if so, whether it is explained by the vestibular stimulation theory.

If there is in fact no difference in effectiveness between spinning and rubbing, rubbing does possess a practical advantage: spinning itself tends to destabilize the visual components of the dream, while rubbing does not. On the other hand, if one is using the technique to change dream scenes, that "disadvantage" becomes an advantage.

Notes

[1] H. von Moers-Messmer, "Traume mit der gleichzeitigen Erkenntnis des Traumzustandes," Archiv Fuer Psychologie 102 (1938): 291-318.
[2] G. S. Sparrow, Lucid Dreaming, Dawning of the Clear Light (Virginia Beach: A.R.E. Press, 1976).
[3] C. Castaneda, Journey To Ixtlan (New York: Simon & Schuster, 1972).
[4] Sparrow, op. cit., 43.
[5] A. Hobson, The Dreaming Brain (New York: Basic Books, 1988).

[From: Stephen LaBerge, (1985). Lucid Dreaming. New York: Ballantine. ISBN 0-345-33355-1]
[Source: The Lucidity Institute]

Chapter 8: Dreaming: Function And Meaning

Why do we have dreams and what do they mean? These questions have for centuries been the subject of a debate that has recently become the center of a heated controversy. In one camp we have a number of prominent scientists who argue that we dream for physiological reasons alone and that dreams are essentially mental nonsense devoid of psychological meaning: "A tale told by an idiot, full of sound and fury, signifying nothing." The idea that dreams are nothing more than "meaningless biology" sounds absurd and rather blasphemous to the opposing camp, a coalition of Freudians and other dream workers committed to the view that we dream for psychological reasons and that dreams always contain important information about the self or some aspects of one's life which can be extracted by various methods of interpretation. This camp takes its credo from the Talmudic aphorism that "an uninterpreted dream is like an unopened letter." There is also a third camp occupying the middle ground, that believes both of the extreme positions on the function and meaning of dreams to be partly right and partly wrong. Its proponents argue that dreams may have both physiological and psychological determinants, and therefore can be either meaningful or meaningless, varying greatly in terms of psychological significance.

This middle position is where I find myself most comfortable. I agree with Sir Richard Burton that

"Truth is the shattered mirror strown in myriad bits; while each believes his little bit the whole to own."

Perhaps, however, we may be able to put together enough of the pieces to reflect the reality of the dream reasonably well. Although people have argued for many centuries over whether dreams represent the addle-minded children of an idle brain, the heaven-sent embodiment of wisdom, or something in between, we will confine our discussion to "scientific" theories of dreaming at least as modern as the 20th century. So then, let us start with Dr. Sigmund Freud.

The Interpretation Of Dreams Revisited

If we are to understand Freud's view of the dream, we need to consider his concept of the dreamer's brain. We know today that the nervous system contains two types of nerve cells (excitatory and inhibitory). Both types discharge and transmit electrochemical impulses to other neurons. Both do this spontaneously, without any kind of outside stimuli, as well as when they themselves receive excitatory impulses from other cells. However, one critical difference between these two types of neurons is that one type, called "excitatory" transmits impulses to other neurons which causes increased nervous activity or "excitation" in them. The other type of neurons is called "inhibitory," because they send messages to other neurons that cause decreased activity or "inhibition." The human brain is constructed of an unimaginably complex network of intricate interconnections between billions of each type of neuron. Generally, the inhibitory neurons play a more important role in the higher functions of the brain.

Before developing his theory of dreams, Dr. Freud had intensively studied neurobiology. But, in his time, only the process of excitation had been discovered; the process of inhibition was not yet known. Based on the assumption of a completely excitatory nervous system, Freud reasoned that nervous, or in his terms, "psychic," energy could therefore only be discharged by means of motor action. This meant that once you got a notion in your head, it was doomed to run around in there

forever until you finally decided to do something about it. Or, alternatively, until it found a way to trick you into unconsciously expressing it in some unintended action like the famous "Freudian slip."

This older view of the nervous system has been caricatured as a "cat on a hot tin roof" model, "with the persistent internal drives generating blasts of energy that keep the ego and conscious system in frenzied movement." [1] We know today that a nervous system of this sort, if it could exist at all, would erupt into uncontrolled seizure activity. However, given the state of knowledge of his time, Freud's view of the unconscious mind as a cauldron seething with socially unacceptable impulses and desires appears perfectly reasonable; and likewise, from it his theory of dreaming can readily be seen to follow.

Let us imagine what might have happened if you were somehow able to ask the master himself why you had a particular dream. Dr. Freud, we may speculate, might have answered something like this:

In the first place, we may be sure that something happened to you a day or two before the dream and that this "day residue"--as we call it--stirred up one of the many repressed wishes that you try to keep closeted away in your unconscious. But, when you drifted off to sleep with no other wish in your conscious mind than to sleep, you withdrew your attention from the external world, setting the stage for your day residue and associated unconscious wish to step forward, demanding satisfaction. All this requires the cooperation of the chief executive of your conscious mind, the ego. But because your pair of suppliants were not, let us say, 'dressed in a socially acceptable manner,' they were at first denied admission to your conscious mind. And that was as it should be! It is the special function of the gate-keeper to prevent unruly and unacceptable impulses, memories, or thoughts from disturbing your ego's conscious mind. The gate-keeper, which we psychoanalysts call the 'censor,' is able to do his job with the help of a big stick we call 'repression,' by means of which these impulses, memories, and thoughts which conflict with personal and social standards of behavior are banished from the conscious mind, along with the painful emotions and memories associated with the conflict. Since the repressed contents cannot be banished entirely, they settle to the bottom of your unconscious mind, where they simmer and seethe like a witches' cauldron.

But now and then, by the power of association, the events of the preceding day, in the form of day residues, dredge up these repressed wishes. Naturally, they seek a way to even partial fulfillment. That is what your day residue and repressed wish were doing, knocking on the door of the ego. However, after the censor threw them out, the vulgar pair, knowing nothing of manners, continued to clamor for admission, raising such a rumpus as to threaten your precious sleep and thereby frustrate your ego's only conscious wish. Fortunately, you were able to continue to sleep, thanks to your dream doing its job. As we say, 'dreams are the guardians of sleep.' Across the border, in your unconscious mind, a special process that we call 'dream-work' constructed a disguise for your repressed wish, out of 'acceptable' imagery linked to it by association. Thus transformed into a superficially presentable image, your wish was able to get by the censor and find expression in the your dreams.

"And that is why," Dr. Freud might well have said, "you had that dream; and please note," he might not have been able to resist continuing, "that your dream killed two birds with one stone: while preserving your sleep, it also allowed the discharge of one of your repressed instinctual impulses. That all this was a good thing seems undeniable;" Sigmund Freud might have concluded, "I need hardly add we regard it as axiomatic that the nervous system obeys the 'nirvana' principle, forever seeking the reduction of tension and the ultimate cessation of action."

In some ways, of course, this aspect of psychoanalysis has strong parallels with Buddhism and other Eastern doctrines. But that brings us no closer to answering your original question, and you might well ask: "But what did my dream mean? Or was it just nonsense?" In that case, Freud would have probably explained that "Every dream has some hidden meaning; since the manifest content of the disguised dream (the dream itself) was the result of the dream-work's transformations of the undisguised wish (the latent content of the dream). Therefore, in order to interpret your dream, it should simply be necessary to reverse the process. Since the dream disguised the latent content with images closely associated with the original wish, we can uncover the hidden message by reasoning backward from the image through a process of interpretation known as "free association." If you had dreamed, let us say, that you were locking a door, Dr. Freud would ask you what was the first thing that comes into your mind in connection with the work "lock?" If you said, "key," Freud would continue, "key?" And perhaps you would reply, "tree." This, as you can see, might go on forever, except that Freud would probably have interrupted the process at this point and drawn on his knowledge of dream symbolism (key in lock...!) explaining that your dream expressed a wish to engage in sex!

In other words, Freud believed that the function of dreaming was to allow the discharge of repressed instinctual impulses in such a way as to preserve sleep, and that the instigating force causing dreams to occur was always an instinctual, unconscious wish. Dr. Freud considered these unconscious wishes to be predominantly sexual in nature. In "Introductory Lectures on Psycho-Analysis," he wrote: "Though the number of symbols is large, the number of subjects symbolized is not large. In dreams those pertaining to sexual life are the overwhelming majority...They represent the most primitive ideas and interests imaginable." [2] In any case, in so far as the instigating force behind every dream was an unconscious wish--whether sexual or otherwise--it follows from Freudian theory that every dream contains meaningful messages in disguised form: the original wish or "dream thought." The fact that all dreams contained unacceptable and unpleasant wishes explained why dreams are so regularly and so easily forgotten. This was because, reasoned Freud, they were (deliberately) repressed: blacklisted by the ego and sent by the censor to the bottom of the swamp of the unconscious.

We know today, thanks to the last 30 years of dream research, that dreams are not instigated by wishes or other psychological forces, but by a periodic or automatic biological process: REM sleep. If dreams are not triggered by unconscious wishes, we can no longer assume that these wishes play any role in dreams at all; and even worse for the Freudian concept of meaning, we can no longer automatically assume that every--or even any--dream has meaning! This is not all of the news recent neuroscience has for Freud; but let us save the bad news for the next section. The good news for Freud is this: every period of dreaming sleep is accompanied by sexual arousal, as indicated in males by erections, and in females by increased vaginal blood flow. Had Freud lived to hear of this phenomenon, he would have almost certainly regarded it as a complete vindication of his belief that at the bottom of every or almost every dream was-- sex!

The Activation-synthesis Model Of Dreaming

In 1977, Drs. Allan Hobson and Robert McCarley of Harvard University presented a neurophysiological model of the dream process that seriously challenged Freud's theory on virtually every point. In a paper they published in the American Journal of Psychiatry entitled "The Brain as a Dream State Generator: An Activation-Synthesis Hypothesis of the Dream Process," they suggested that the occurrence of dreaming sleep is physiologically determined by a "dream state generator" located in the brain stem. This brain stem system periodically triggers the dream-state with

such predictable regularity that Hobson and McCarley were able to mathematically model the process to a high degree of accuracy. During the REM periods produced when the dream- state generator is switched "on," sensory input and motor out-put are blocked, and the forebrain (i.e., the cerebral cortex, the most advanced structure in the human brain) is activated and bombarded with partially random impulses generating sensory information within the system. The activated forebrain then synthesizes the dream out of the internally generated information, trying its best to make sense out of the nonsense it is being presented with."

"The primary motivating force for dreaming," emphasize Hobson and McCarley, "is not psychological but physiological since the time of occurrence and duration of dreaming sleep are quite constant, suggesting a pre-programmed, neurally determined genesis." They see the major drive for the dreaming process as not only automatic and periodic but apparently metabolically determined; of course, this conception of the energetics of dreaming flatly contradicts the classical Freudian notion of conflict as the driving force for dreams.

As for the "specific stimuli for the dream imagery," they continue, these appear to arise from the brain stem and not from cognitive areas of the cerebral cortex. "These stimuli, whose generation appears to depend upon a largely random or reflex process, may provide spatially specific information which can be used in constructing dream imagery." Hobson and McCarley argue that the bizarre distortions in dream content attributed by Freudians to the disguising of unacceptable content by the "dreamwork" probably have a simpler neurophysiological explanation instead: such bizarre features of dreams as the condensation of two or more characters into one, discontinuous scene shifts, and symbol formation may merely directly reflect the state of the dreaming brain.

"In other words," the Harvard neurophysiologists argue, "the forebrain may be making the best of a bad job in producing even partially coherent dream imagery from the relatively noisy signals sent up to it from the brain stem. The dream process is thus seen as having its origin in sensorimotor systems, with little or no primary ideational, volitional, or emotional content. This concept is markedly different from that of the 'dream thoughts' or wishes seen by Freud as the primary stimulus for the dream."

Hobson and McCarley view "the elaboration of the brain stem stimulus by the perceptual, conceptual, and emotional structure of the forebrain," as primarily synthetic and constructive, "rather than a distorting one as Freud presumed." According to the Activation-Synthesis model, "best fits to the relatively inchoate and incomplete data provided by the primary stimuli are called up from memory...The brain, in the dreaming sleep state, is thus likened to a computer searching its addresses for key words. Rather than indicating the need for disguise, this fitting of...experiential data to [genetically programmed] stimuli is seen as the major basis of the 'bizarre' formal qualities of dream mentation." Scoring one more point against Sigmund Freud, they add that "there is, therefore, no need to postulate either a censor or an information degrading process working at the censor's behest."

Hobson and McCarley see our usual poor ability to recall our dreams as reflecting "a state-dependent amnesia, since a carefully effected state change, to waking, may produce abundant recall even of highly charged dream material." So that if you are rapidly awakened out of REM sleep, you are likely to remember dreams that you would otherwise be just as likely to forget. Hammering a final nail into the coffin containing Freud's theory of dreams, they write: "There is no need to invoke repression to account for the forgetting of dreams."

As was only to be expected, Hobson and McCarley's paper stimulated counter attacks from the psycho-analytic establishment, which responded that Freud's neurological models were in no way crucial to his psychological theories. In the view of Dr. Morton Reiser, Chairman of the Department of Psychiatry at Yale University, and a past president of the American Psychoanalytic Association, McCarley and Hobson overextend the implications of their work when they say it shows that dreams have no meaning. I agree with them that their work refutes Freud's idea that a dream is instigated by a disguised wish. Knowing what we do now of brain physiology, we can no longer say that. The wish may not cause the dream, but that does not mean that dreams do not disguise wishes. The brain activity that causes dreams offers a means whereby a conflicted wish can give rise to a particular dream. In other words, wishes exploit--but do not cause--dreams. [3]

The degree of controversy stimulated by the Hobson and McCarley paper was truly remarkable. An Editorial in the American Journal of Psychiatry a year later stated that the Harvard paper "provoked more letters to the Editor than the Journal had ever received before." Unexpectedly, what seemed to be stirring so many people up was not Hobson and McCarley's treatment of Freud, but their treatment of the dream. The view that "dreams were after all merely the senseless, random accompaniment of the autonomous electrical activity of the sleeping Central Nervous System" did not sit well with many dream researchers, to say nothing of therapists and other dream workers accustomed to putting dreams to a variety of practical uses.

Anybody who has ever awakened from a dream, exclaiming with delight, "what a wonderful plot that was!" will know from their own experience that at least sometimes, dreams are much more coherent than would seem to be suggested by Hobson- McCarley's model of "the forebrain making the best of a bad job in producing even partially coherent dream imagery from the...noisy signals sent up to it from the brain stem." In the view of many scientists and dream researchers including myself, the fact that dreams can be such superbly coherent and entertaining stories is an indication of the need to concede to the forebrain at least an occasional or partial degree of control during dreaming. How could we construct such extended and coherent dream plots if the higher brain centers are limited to mere improvisation with whatever unrelated props, people, and scenes that the "noisy signals" from the brain stem happen to kick upstairs? The dream Hobson and McCarley seem to envision would be like "And now for something completely different!" every minute or two. The fact that we are able at times to produce dreams that are so wisely and elegantly constructed that they can and do serve us as teaching stories suggests that higher order mental functioning must in some way be able to influence the lower order functioning of the dream state generator.

The phenomenon of lucid dreaming suggests even more strongly the influence of the cerebral cortex on the construction of dreams. For if your dreams were nothing more than the results of your forebrain "making the best of a bad job in producing even partially coherent dream imagery from the relatively noisy signals sent up to it" from your brain stem, how would you be able to exercise volitional choice in a lucid dream? How would you be able to carry out a previously planned dream action? How would you be able to deliberately decide to, let us say, open a door to see what you might find there?

Lucid dream reports abound with counter examples, showing that dreamers can at times have their own feelings, intentions, and ideas. When dreamers realize that they are dreaming, they often experience a feeling of exhilaration. This feeling is more like a response to a higher order perception, rather than to a random brain-stem stimulus. As for intentions and ideas, when dreamers attain lucidity, they typically remember intentions about what they wanted to do in their next lucid dream, and can remember ideas in the form of ideals and principles of behavior such as "face your

fears," "seek positive outcomes," or "remember your mission." Our oneironauts routinely make use of this last principle when sleeping in the laboratory.

Finally, if all of the eye movements of REM sleep are randomly generated by a madman in the brain stem, how are lucid dreamers able to voluntarily execute eye movement signals in accordance with pre-sleep agreement? Of course, the answer to all of these rhetorical questions is that the Hobson-McCarley hypothesis cannot be the whole story. On the contrary, I believe Hobson and McCarley are right about much of what they say about physiological determinants of the form of dreams; it is evident that dreams also have psychological determinants, and therefore any satisfactory theory of dream content ought to include both. It also ought to explain why and under what conditions dreams are sometimes coherent, brilliantly witty narratives, and in other conditions, incoherent ravings. And why in some dreams are we deluded and in others lucid? And why are some dreams profoundly meaningful and others pointless nonsense?

As for meaning and nonsense, the Activation-Synthesis model of dreaming seems willing to completely disregard the possibility that dreams could have any intrinsic or interesting meaning whatever. Given the "forebrain making the best of a bad job..." from the random signals sent up from the brain stem, the most we could reasonably expect if this were the case is what is called in computer terms "GIGO," an acronym for "Garbage In, Garbage Out." Hobson, at least, seems to say as much in a recent interview: "Dreams are like a Rorschach inkblot. They are ambiguous stimuli which can be interpreted any way a therapist is predisposed to. But their meaning is in the eye of the beholder--not in the dream itself." [4] I can hear it now: a psychiatrist asks a patient, "What does this dream make you think of?" And receives the reply: "An inkblot!"

Among the psychophysiologically minded dream researchers a major criticism of the Activation-Synthesis model was that it was essentially a one-way street, allowing traffic only to proceed upward from brainstem to forebrain (from lower mental function to higher mental function). But the way the brain is actually put together would require a two-way street, allowing forebrain control of brain stem activation, and therefore allowing higher cortical functions such as thinking and deliberate action to influence the dream. This is the same criticism I just made regarding the inability of the Hobson and McCarley model to deal with lucid dreaming.

Some sleep and dream researchers argued that the Activation- Synthesis model missed the central question about dreaming altogether. According to Dr. Milton Kramer of the University of Cincinnati, Hobson and McCarley's approach is "not central to the functional problems of dreaming. When it comes to dreams, two things are important--meaning and function. Do dreams enlighten us about ourselves? Will they make us smarter, change our personality, change our mood, solve our problems, have an application to our daily lives?" Kramer concluded that "I think the essence of dreams is psychological. It's all very well to find in dreams that a person is walking. The important questions are, 'Where is he walking? Why is he walking there?' Those are the continuing mysteries of dreams and that is what we want to know." [5]

So how does the Activation-Synthesis model measure up if we use Kramer's two criteria: meaning and function? As to the meaning of dreams, in Hobson and McCarley's model there is none. Regarding function, Hobson has offered a possible function of the dream state:

A crude analogy to computers helps to make a point even if it may violate the reality of brain function: Every information processing machine has both hardware and software components. To create a nervous system, the genetic code must program both a structural blueprint and a set of operating instructions. To maintain the neurons it would make sense to utilize a standard set of operating

instructions to activate and test the system at regular intervals. From an intuitive point of view, it is appealing to consider REM sleep as the expression of a basic activity program for the developing CNS that would ensure the functional competence of neurons, circuits, and complex activity patterns before the organism was called upon to use them. It would be particularly important for such a system to have a high degree of reliability in both time and in space. These features are to be found in the periodicity and duration constancy of REM and in the stereotyped nature of the activity. [6]

Elsewhere, Hobson elaborates:

I believe that dreaming is the (sometimes outward) sign of a genetically determined, functionally dynamic blueprint of the brain designed to construct and to test the brain circuits that underlie our behavior-including cognition and meaning attribution. I also believe that this test program is essential to normal brain-mind functioning but that you don't have to remember its products to reap its benefits. [7]

Dreaming To Forget?

In a paper published in 1983 in the British journal Nature, Nobel Laureate Francis Crick (one of the team that cracked the genetic code and unraveled the mystery of DNA) and co-author Graeme Mitchison proposed that the function of dream sleep is to remove certain undesirable modes of interaction in networks of cells in the cerebral cortex. We postulate that this is done in REM sleep by a reverse learning mechanism, so that the trace in the brain of the unconscious dream is weakened, rather than strengthened by the dream. [8]

That, in a nut-shell, is their "reverse-learning" theory of dreaming.

Crick and Mitchison's theory is derived from two basic hypotheses: the first is that the cerebral cortex, as a completely interconnected network of neurons, "is likely to be subject to unwanted or 'parasitic' modes of behavior, which arise as it is disturbed either by the growth of the brain or by the modifications produced by experience."

Their second hypothesis is even more tenuous than the first: it proposes that if these hypothetical 'parasitic' modes of neuronal activity do in fact exist, then it might be that they "are detected and suppressed by a special mechanism" hypothetically operating during REM sleep. This mechanism is described as having "the character of an active process which is, loosely speaking, the opposite of learning." Crick and Mitchison call this hypothetical process "reverse learning" or "unlearning," and explain that it "is not the same as normal forgetting" and that "Without it we believe that the mammalian cortex could not perform so well."

"The mechanism we propose," write Crick and Mitchison, drawing on the Hobson-McCarley conception of the neurophysiology of dreaming, is based on the more or less random stimulation of the forebrain by the brain stem that will tend to excite the inappropriate modes of brain activity...especially those which are too prone to be set off by random noise rather than by highly structured specific signals. We further postulate a reverse learning mechanism which will modify the cortex...in such a way that this particular activity is less likely in the future...Put more loosely, we suggest that in REM sleep we unlearn our unconscious dreams. "We dream in order to forget."

To reiterate: what they are suggesting is that everything that happens in any of your dreams is being actively unlearned by your brain--that is why you are dreaming about it: merely "in order to forget it."

What exactly does this mean? According to the reverse- learning theory, when we remember our dreams we are re- learning exactly what we were trying to unlearn. This would seem to represent at least a partial failure of the reverse- learning mechanism, and "one might wonder what effects its failure might have." Crick and Mitchison suggest that complete failure (remembering all of one's dreams) might lead to "grave disturbances-a state of almost perpetual obsession or spurious, hallucinatory associations..." A partial failure (remembering several dreams a night) "should produce unwanted responses to random noise, perhaps as hallucinations, delusions, and obsessions, and produce a state not unlike some schizophrenias."

Crick and Mitchison's motto is, "we dream in order to forget." Well, maybe they do for all I know. Unfortunately, they go further than that, seeming to feel that it would be better for all of us to learn to forget our dreams: "In this model," they write, "attempting to remember one's dreams should perhaps not be encouraged, because such remembering may help to retain patterns of thought which are better forgotten. These are the very patterns the organism was attempting to damp down."

Certainly, if the reverse learning model were followed to its logical conclusion, it would seem to call for the shut-down of all psychological analysis of dreams, all attempts at remembering and interpretation of dreams, in fact the complete shutdown of the dream work industry. Fortunately, it appears that there is absolutely no direct evidence for "unlearning" during REM. In fact, there doesn't appear to be even any evidence for "unlearning" of any kind in any state, in any living organism, anywhere. "Unlearning" as it now exists is only a hypothetical concept, perhaps of some relevance to computers, but there is no proof that it has any application to human beings. In fact, Crick and Mitchison admit "A direct test of our postulated reverse learning mechanism seems extremely difficult." [9]

There is, in short, no convincing argument for this theory. It just might be true or partially true, but until direct evidence supporting it is brought forward, it must be viewed as an unlikely possibility. Even if there were some substance to reverse-learning theory, Crick and Mitchison's conclusions about the desirability of dream recall are not necessarily correct. On the contrary, the strongest argument against the theory may be the catastrophic effects they predict to result from even partial failure of the reverse-learning mechanism. Certainly, people who habitually remember their dreams do not seem any more prone to "hallucinations, delusions, and obsessions" than are people who habitually forget their dreams. Similarly, if the unlearning theory were true, dream deprivation would interfere with the "reverse-learning" process, producing disastrous effects. However, people have been deprived of REM sleep for many nights and in some cases years without showing any signs of mental breakdown. So for any of you dreamers concerned about whether you may be messing up your mind by remembering your dreams, I would suggest that you need not worry!

The Functions Of Dreaming And The Advantages Of Consciousness

Let us return to the question with which we began this chapter: "Why do we dream?" Though we have considered only a few here, there are many answers that could be and have been proposed to this question. But we can justly rule out in advance any theory of the meaning and function of dreams that does not make as much sense when applied to the dreams of a tree shrew or a whale

as to the dreams of a hairless speaking primate--meaning us! Whatever the explanation for dreaming must be, we must dream for the same reason that all mammals have dreamed for more than a hundred million years. Then, why do all mammals dream? Because all mammals have REM sleep. Since humans are mammals, the biologically correct answer to the question "Why do we dream?" is, "For the same reason that any mammal does, because we have REM sleep." Yet, while technically correct, this answer is not completely satisfactory; for it merely leads to the question, "But then why do all mammals have REM sleep?"

This is a question for evolutionary biology. According to the available evidence, it seems that Active or REM sleep evolved about one hundred and thirty million years ago, when early mammals gave up laying eggs and first began to give birth viviparously (born live, not hatched). Non-REM or Quiet Sleep, on the other hand, seems to have arisen some fifty million years earlier, when the warm-blooded mammals first evolved from their cold-blooded reptilian ancestors.

The evolution of sleep and later of dreaming was far too widespread and behaviorally significant to have occurred by accident, and they presumably came into being through the usual mechanism which Darwin made famous: "natural selection". The idea is that just those genetic variations which provide the organism with some survival advantage are selected by evolution. Due to genetic variability, at any one time there is a wide range of characteristics exhibited in the population of every species. For any given environment, some of these characteristics will be more favorable than others to a species, increasing the probability that those individuals of the species which possess the favorable variation will live long enough to reproduce, passing on their genes to progeny who in turn will be likely to survive long enough to replicate, and so on. If an inherited trait offers a large enough advantage, before long all members of a given species will possess it, and carry the genes to pass it on. Since this must have been the case with sleep and dreaming, we can assume that they serve some adaptive (i.e., useful) function or functions.

All animals cycle once a day through a "circadian" (approximately 24 hours long) rest-activity rhythm. Some animals such as owls and mice rest in daylight and are active at night; others, such as humans, usually act in the light and rest in the dark. Sleep tends to occur during the rest phase of the 24-hour cycles. Thus, one of the primary adaptive advantages or "functions" of sleep is to enforce immobility on the animal during the rest phase of the circadian cycle, both to ensure its resting and keep it safely in its nest, burrow, or home. Mother nature's original idea of sleep (probably also familiar to your own mother) was to keep you off the streets after dark, and out of trouble.

If you recall that NREM sleep arose at the same time that mammals evolved from reptiles, you will have a hint as to an additional function of sleep. Reptiles were dependent upon external energy sources (primarily the sun) to maintain a high enough body temperature to allow them to undertake the business of living (principally feeding, fleeing and sex). Although reptiles enjoy a lifelong free energy subsidy from the sun, it wasn't always at their disposal, for example at night, when they might have an urgent need to escape from some hungry nocturnal predator. Warm-blooded mammals, on the other hand, were no longer completely at the mercy of weather and time of day, because they maintained their own constant internal temperatures. The cost, however, was great: being warm-blooded took much more energy than being cold-blooded. Their inner fires had to be fueled with food that had to be caught at no small energetic cost to the mammal. The need of warm-blooded mammals to economize energy made energy conservation therefore, an adaptive survival trait. To see how effectively sleep accomplishes this function, consider the case of two little mammals with high metabolic rates, the shrew and the bat. The shrew sleeps very little and has a life expectancy of no more than two years; the bat, in contrast, sleeps twenty hours a day and as a result can expect to live as many as eighteen years! If we convert these lifetimes into years awake,

the bat is still ahead with three years of active life compared to the shrew's two. There seems no doubt that sleep serves an energy conservation function keeping warm-blooded, fast-moving creatures from burning out too fast. This suggests that there is more truth than fiction to the old aphorism about getting a good night's sleep!

All right, you might say, so that's why we have Quiet Sleep, but why did Active Sleep evolve and with it dreaming? Certainly, there must have been very good reasons for it, since this state has many disadvantages. For one, your brain uses much more energy during dreaming than it does while awake or in Quiet Sleep. For another, there is the fact that the body is paralyzed while you are dreaming, significantly increasing the sleeper's vulnerability. In fact, the amount of dreaming sleep for a given species is directly proportional to the degree of safety from predators; the more dangerous life is, the less a species can afford to dream.

Given these drawbacks, Active Sleep must have offered particularly useful advantages to the mammals of one hundred and thirty million years ago. We can guess one advantage if we remember that this was just the point in evolutionary history when mammalian mothers gave up laying eggs in favor of bearing live young instead. So what advantages might Active Sleep have offered to our ancestral mothers? The answer can be seen, I think, if you recall that egg-hatched lizards or birds break out of their own shells already sufficiently developed to survive on their own if necessary. Viviparous offspring, of which the human baby provides an unexcelled example, are, on the contrary, less developed at birth and often completely, helpless. Viviparous infants have to get through a great deal of learning and development, especially of the brain, in the first few weeks, months, and years of life.

In contrast to the hour and a half an adult spends in REM sleep each night, a new-born baby, who sleeps sixteen to eighteen hours a day is likely to spend 50% of all this time-- as much as nine hours a day--dreaming! The fact that the amount and proportion of REM sleep decreases throughout life suggested to several dream researchers [10] that REM sleep may play an important role in the development of the infant brain, providing an internal source of intense stimulation which would facilitate the maturation of the infant's nervous system as well as help in preparing the child for the limitless world of stimulation it will soon have to face.

The foremost French sleep researcher, Professor Michel Jouvet, of the University of Lyon, has proposed a similar function for Active Sleep: according to him, dreaming permits the testing and practicing of genetically programmed (i.e., instinctual) behaviors without the consequences of overt motor responses--thanks to the paralysis of this Paradoxical state of sleep. So the next time you see a newborn baby girl or boy smiling in their sleep, don't be surprised if they turn out to be perfecting their perfect smile to charm a heart they are yet to meet!

Well then, so now we know why babies dream. But if that were all there is to it, why wouldn't REM sleep completely disappear by adulthood? Well it might, except that there does seem to be something more to it, providing adults with a good reason to continue to dream. The reason is this: Active Sleep has indeed been found to be intimately involved with learning and memory.

The evidence connecting the dream state with learning and memory is of two kinds: the most direct evidence is an extensive body of research indicating that learning tasks that require significant concentration or the acquisition of unfamiliar skills is followed by increased REM sleep. The second type of evidence is less direct but still quite convincing: many studies have shown that memory for certain types of learning is impaired by subsequent REM deprivation. Psychologists distinguish two varieties of learning: prepared and unprepared learning. Prepared learning is easy and quickly ac-

quired while unprepared learning is difficult and only slowly mastered with great effort. According to Boston psychiatrists Dr. Ramon Greenberg and Dr. Chester Pearlman, it is only unprepared learning that is REM- dependent. In of their experiments, which involved rats, they easily learned that cheese was located behind one of two doors--and an electric shock behind the other: this is called "simple position" learning, and most animals are well equipped for it. If on the other hand, the position of reward and punishment are reversed on successive trials, so that each time shock is to be found where cheese was on the previous trial and vice versa, most animals find it difficult (or impossible) to work out this more complex pattern and learn where to expect what; in other words, for rats, "successive position reversal" is an instance of unprepared learning.

After Greenberg and Pearlman subjected rats to these two varieties of task, they deprived them of REM sleep and then re-tested the rats for learning. They reported that while simple position learning was unimpaired by REM deprivation, successive position reversal was "markedly" impaired. "This finding is noteworthy" they remarked, "because successive position reversal is a task which clearly distinguishes the learning capacities of species with REM sleep (mammals) from those without it (fish)." The implication is that REM sleep makes more complex learning possible than would otherwise be the case.

Greenberg and Pearlman conclude that dreaming sleep "appears in species that show increasing abilities to assimilate unusual information into the nervous system." They suggest that the evolutionary development of the dream state "has made possible the increasingly flexible use of information in the mammalian family. That this process occurs during sleep seems to fit with current thinking about programming and reprogramming of information processing systems. Thus, several authors have pointed out the advantage of a separate mechanism for reprogramming the brain in order to avoid interference with ongoing functions." [11]

One of these authors is Christopher Evans, whose computer- analogy theory of dreams is presented in his recent book, Landscapes of the Night: How and Why We Dream. The late Dr. Evans was an English psychologist with an abiding interest in computers who proposed that dreaming is the brain-computer's "off-line" time when the mind is assimilating the experiences of the day and at the same time updating its programs.

Not only is dreaming associated with learning and memory, but it also appears to play a somewhat broader role in the processing of information in the nervous system, including coping with traumatic experiences and emotional adjustment. The dream state has also been proposed as a restorative for mental functioning; according to Professor Ernest Hartmann, REM sleep helps us to adapt to our environments by improving our mood, memory, and other cognitive functioning through restoring certain neurochemicals that are depleted in the course of waking mental activity. [12]

Dreaming sleep has also been shown to play a general role in reducing brain excitability. [13] It can have a favorable effect on our moods, making us, for example, less irritable. Janet Dallet, in a dissertation, has reviewed a number of theories of dream function, concluding that "contemporary theories tend to focus on the function of environmental mastery, viewed from one of three perspectives: (a) problem solving (b) information processing, or (c) ego consolidation." [14]

Finally, psychologist Ernest Rossi has attributed to dreams a developmental function:

In dreams we witness something more than mere wishes; we experience dramas reflecting our psychological state and the process of change taking place in it. Dreams are a laboratory for experimenting with changes in our psychic life...This constructive or synthetic approach to dreams can be clearly stated: Dreaming is an endogenous process of psychological growth, change and transformation. [15]

It might be said of the diverse theories of dream function that they all are partly right and they all are partly wrong: right in so far as they say what a function of dreaming is, and wrong to the extent that they say what the function of dreaming is. The situation is analogous to the traditional tale of the blind men and the elephant. In this story the blind men each sought to discover the nature of an elephant by means of touch alone. From the part they grasped, they believed they knew the nature of the whole. An elephant was like a rope for the blind man who grasped it by the tail; like a rug for the one who grasped its ear; like a pillar for the one who grasped its leg; and so on. In like manner, the proponents of the various theories of dreams have each grasped not the whole as they thought, but a part of the function of dreams. Freud, for example, in surveying the many opinions about dreams, judged almost all of these previous views to have missed the forest for the trees. His own theory, which placed great importance on sex as the basis of all dream content, he considered a "view from the heights," but--as it is perhaps apparent today--Freud himself mistook a wood for the world. And as the irreverent have put it, he seems to have grasped the elephant by the balls. Things could be worse though, for others seem to have grasped the elephant by "the feathers"!

Putting aside, for the moment, the question of the special functions of dreaming, let us ask what is the most basic or general function that dreaming is likely to serve. Since dreaming is an activity of the brain, we must first ask what function brain activity serves? And because the most general biological purpose of living organisms is survival, this must also be the most general biological answer to the purpose of brain activity. The brain fosters survival by regulating the organism's transactions with the world and with itself. These latter transactions would perhaps be best achieved in the dream state, when sensory information from the external world is at its minimum.

As organisms proceed up the evolutionary ladder, new forms of cognition and corresponding actions emerge. The four major varieties of action are reflexive, instinctive, habitual and intentional, in ascending order. Behaviors lower on the evolutionary scale are relatively fixed and automatic, while behaviors higher on the scale are more flexible. Automatic behaviors are best if the situation they are designed for is relatively invariable. So, for example, since we must breathe every minute of our lives, this is very efficiently accomplished by a reflexive mechanism. Likewise, instinctive action is effective as long as the environment we are in is not too different from the one our ancestors lived in. Habit, too, is useful while the environment we have learned to get along in doesn't change too much. Intentional or deliberate action has evolved in order to handle environmental changes ("novelty") that our habitual behavior is inadequate to cope with. This highest level of cognition, which allows intentional action, is usually referred to as reflective consciousness. It is the same cognitive function that we call lucidity, when speaking in the context of dreaming.

Reflective consciousness offers the advantage of flexible and creative action as much to the dream state as to the waking state. More specifically, consciousness allows dreamers to detach themselves from the situation they are in, and reflect on possible alternative modes of action. Lucid dreamers are thus able to act reflectively, instead of merely reflexively. The important thing for lucid dreamers is their freedom from the compulsion of habit; they are capable of deliberate action in accordance with their ideals, and are well able to respond creatively to the dream content. Seen in this light, lucid dreaming does not at all appear as a mere abnormality or meaningless curiosity; rather, it

represents a highly adaptive function, the most advanced product of millions of years of biological evolution.

The Meaning Of Dreaming

Since the evidence indicates that dreaming serves important biological functions, dreaming cannot be "meaningless biology." On the contrary, dreams are, at very least, meaningful biology. But does this mean that dreams must be meaningful psychology? I think the answer is "not necessarily." If you ask, "What do dreams mean?" the answer will depend upon just exactly what you mean by "meaning." But perhaps we can agree to use "meaning" to mean placing anything--let us say, in this case, a dream--in some explanatory context or other. Please note, however, that explanatory contexts vary widely from person to person. For some, interpretation or translation seems most appropriate under the assumption that dreams are messages to ourselves. Others will seek mechanistic explanations in a physiological or psychological context, and still others will be inclined to treat the dream on its own terms as it relates to itself. Which approach is right? Or, rather, which is right for which dream?

Freud assumed that the events occurring in dreams (lucid or otherwise) were by their very nature necessarily symbolic of unconscious motives. This assumption, although undoubtedly correct in certain circumstances, is equally undoubtedly misleading in others. Many dream interpreters would like to believe that every element of every dream is equally subject to symbolic interpretation, or that "all dreams are equal." This is an understandable belief, for dream interpreters could not expect to stay in business for very long if they were to say of a dream presented for analysis that "this dream is meaningless," or even, "not very interesting." Dreamers meeting with such responses would be inclined to take their dreams elsewhere until they found someone more willing to tell them what their dreams "really" meant. Also, it is a sensible working hypothesis when presented with a dream for interpretation to assume that the dream does have meaning, or, at least, that part of it does.

In the case of psychotherapists and their clients, the relevant kind of meaning assumed and sought is psychological. However, the assumption that every dream contains significant psychological information is yet to be subjected to rigorous test. It seems to me that to assert that every dream is equally informative psychologically or otherwise, informative is like supposing that every sentence you say is equally interesting, coherent, or profound!

There is a contrary way of looking at dreams, the "existential" view, which treats dreams as lived experiences composed of imagined interactions and elements which could be symbolic, or literal, or somewhere in between. Flying, for instance, could be in one case the symbolic expression of any number of unconscious desires, such as the wish to transcend all limitation, or as Freud would suggest, the wish to engage in sexual activity. While in another case, it might be merely the most convenient mode of travel available to the dreamer who wants to move from one place to another within the dream world.

From these foregoing considerations, we would probably be wiser to leave the degree of symbolic significance attributed to a given dream event as an empirical rather than an axiomatic matter--as something to test rather than to assume. It seems safe to conclude that for a given dreamer and dream, flying was apparently symbolic of this or that for a certain dreamer and dream only if such an interpretation either impresses the dreamer as having a sufficiently significant explanatory power for his dream, or if it is otherwise supported by compelling evidence.

It is important to realize that just because a particular dream can sometimes be interpreted in symbolic terms doesn't mean that it was intended as a communication in the first place. If dreams are important messages to ourselves, as suggested by the oft-repeated proverb--"an uninterpreted dream is like an unopened letter", then why do we throw most of them away? This is surely what we do when we forget our dreams and we forget the great majority of them. The "letter- to-yourself" theory of dreams is in even worse trouble when we remember the mammalian origins of dreaming. Consider the family dog: of the tens of thousands of dreams that Fido will dream in his lifetime--how many are likely to be interpreted? By Fido, none at all! By his owners, perhaps a few. But if humans are the only mammals equipped with the linguistic skills to use symbolic language, what purpose could dreaming serve for the thousands of species of non-human dreamers? And if it could serve no purpose to our ancestors, how could it have ever evolved?

I think that the answer is clear. Dreaming must serve purposes other than talking-to-ourselves, as I spoke of earlier in the chapter; moreover, these purposes must be achievable without requiring dreams to be remembered, to say nothing of interpreted. In fact, there is a good reason why remembering dreams might be maladaptive for all non- linguistic species, including our ancestors. To see why, consider how we are able to distinguish memories of events that we dreamed and those that actually occurred. It is something that we have learned to do thanks to language. Remember Piaget's account of the child's development of the concept dream. When, as children, we remembered our earliest dreams, we assumed, at first, that they had "actually" happened just like everything else. After enough repetitions of our parents telling us that some of our experiences were "only dreams" we learned to distinguish memories of inner dream events from memories of external physical world events. But how would we ever have been able to untangle the two realities without the help of other people telling us which was which?

Animals, however, have no way to tell each other how to distinguish dreams from reality. Imagine your favorite cat living on the other side of a tall fence that protects it from a vicious dog. Suppose your cat were to dream that the wicked dog was dead, and replaced by a family of mice. What would happen if the cat were to remember this dream when it awoke? Not knowing it was a dream, it would probably hungrily jump over the fence, expecting to find a meal. But instead, it would find itself a meal--for the dog!

Thus dream recall would seem to be a bad thing for cats, dogs, and all of the rest of the mammalian dreamers except humans. This could explain why dreams are difficult to recall. They may be so, according to this view, because of natural selection. We and our ancestors might have been protected from dangerous confusion by the evolution of mechanisms that made forgetting dreams the normal course of affairs. But if the theory I have proposed for why dreams are difficult to recall is correct, contrary to Crick and Mitchison, remembering dreams should do humans no harm, precisely because they can tell the difference between dreams and waking experiences.

In conclusion, I would suggest that the dream is not so much a communication as a creation. In essence, dreaming is more like world making than like letter writing. And if, as we have seen, an uninterpreted dream isn't like an unopened letter, then what is it like? Having demolished a popular proverb, let us replace it with another, that seems to come closer to doing the dream justice: "an uninterpreted dream is like an uninterpreted poem". If I am right, dreams have much more in common with poems than they do with letters. The word poem is derived from a Greek very meaning to create, and I have already argued that the essence of dreaming is closer to creation than to communication. Are all poems equally worth interpreting? Are all poems equally coherent, effective, or worth reading? If you wrote a dozen poems a night every night of your life, what do you suppose you would find among your several hundred thousand poems. All masterpieces? Not

likely. All trash? Not likely either. What you would expect is that among great piles of trivial doggerel, there would be a smaller pile of excellent poems, but no more than a handful or perfect masterpieces. It is the same with your drams, I believe. When you have to do five or six shows every night, many of them are likely to lack inspiration. It is true that you can cultivate your dream life so that the time you spend there will grow more rewarding as the years pass. But why should you expect that every one of your dreams is worth taking the time to interpret? And yet, if a poem or a dream calls out to you to interpret it, by all means find out what it means.

It would be a very unusual poet who created poetry primarily for the amusement and instruction of critics or interpreters. He or she doesn't need a critic on hand in order to be affected, perhaps even transformed, by the poem's creation. When we read a poem, we don't need to interpret it to be deeply moved, edified, inspired, and perhaps even enlightened. Having said that neither poems nor dreams have any need of interpretation doesn't mean that it is never useful. On the contrary, it seems clear that intelligent criticism or interpretation can at times greatly increase the depth of our understanding of a poem and in the best of circumstances, of ourselves as well. It is the same with the dream.

Notes

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Chapter 9: Dreaming, Illusion, and Reality

"In the ages of the rude beginning of culture," wrote Nietzsche, "man believed that he was discovering a second real world in dream, and here is the origin of all metaphysics. Without dreams, mankind would never have had occasion to invent such a division of the world. The parting of soul and body goes also with this way of interpreting dreams; likewise, the idea of a soul's apparitional body: whence all belief in ghosts, and apparently, too, in gods." [1]

I am inclined to agree with Nietzsche in placing the blame for belief in ghosts, gods, and life after death on the doorstep of the dream. Let us suppose that the idea of a soul-body derives from subjective experiences in the dream world. Whether or not the soul would then be granted the status of objective reality would depend on the reality status given to the dream. If early humans believed they had discovered in the dream a second "real world," what might they have meant? Did they merely mean that the dream world had a subjectively verifiable existence? That dreams were only real while they lasted? Or did dreams exist actually and objectively in some subtle plane of existence every bit as real as the physical world?

These are only a few of the possibilities we might consider in trying to settle the question of whether dreams are real, and if so, how the mental reality of the dream world might compare with the physical reality of the world you are reading this book in.

There are really two issues here: one is the degree to which an experience seems subjectively real (at least while it is happening). The other issue is independent of the first; this is the degree to which the experience seems objectively real in the sense that it produces actual effects on other parts of reality. We say that something really exists if it can produce an effect (of any kind) on another member of some class of existence. As an example, imagine a very special little object, which is so soft that you can't touch it; and covered with invisible paint so you can't see it, and moreover transparent to every kind of light; it is also odorless; it has no weight; and it has no other property whereby it can be grasped. In short, there seems to be no way in which you can interact with it. So how would you know it exists? We only know a thing exists when it interacts with other existing things.

Now we come to the specific question that is relevant here: what about the reality of the dream? Our studies in Chapter 4 have shown without any doubt that lucid dreams produce real effects on our brains and bodies. Score one for the dream! There seems no doubt that dreams are as real as real can be, according to the subjective point of view of the dream.

But even though we have demonstrated the subjective reality of dreams, we have not faced the bigger question: is there any evidence suggesting that dreams can be objectively real as well? There are in fact several enigmatic phenomena that seem to raise the possibility that, in some circumstances at least, the dream world may be at least partially objective. One of these enigmas is the uncanny experience in which a person feels that he or she has somehow temporarily detached from or "left his or her body." Survey data indicate that a surprising number of people have had such so-called "out-of-body experiences" (OBEs) at least once in their lives. [2]

Very frequently those who have this experience become unshakable convinced that they, or at least some part of themselves, are capable of existence independent of their bodies.

Another phenomenon whose existence is widely attested to is the mysterious mode of information transfer called extra-sensory perception (ESP). A wealth of anecdotal evidence supports the idea that ESP, working across both space and time sometimes occurs. If it is indeed possible to "perceive" in some fashion events that are happening at a distance, or even those that have not yet happened, space and time must be other than what they seem, and the same thing goes for subjective and objective!

Accounts of "mutual dreaming," (dreams apparently shared by two or more people) raise the possibility that the dream world may be in some cases just as objectively real as the physical world. This is because the primary criterion of "objectivity" is that an experience is shared by more than one person, which is supposedly true of mutual dreams. In that case, what would happen to the traditional dichotomy between dreams and reality?

These mysterious phenomena that threaten the simplicity of our common sense view of life are all primarily children of the night. Surveys indicate that more spontaneous psi experiences are reported to occur during dreaming than in the waking state. [3] Most out-of-body experiences tend likewise to occur while the person is dreaming or at least in bed. Dean Shiels, an American anthropologist, studied the OBE in 67 different cultures around the world and found that sleep was regarded as the most important source of OBEs in about 80% of the cultures in his sample. [4]

How does all this relate to lucid dreams? I propose that OBEs are actually variant interpretations of lucid dreams; that dream telepathy will provide the basis for an explanation of the occasional accuracy of paranormal OBE vision; and laboratory experiments with mutual lucid dreams will be suggested as a means of testing the objective reality of shared dream worlds.

Although telepathic experiences also apparently occur during the waking state, as I already mentioned, surveys indicate that most instances of such phenomena occur in precognitive dreams. The following is a remarkable example of such a dream.

"Many years ago when my son, who is now a man with a baby a year old, was a boy I had a dream early one morning. I thought the children and I had gone camping with some friends. We were camped in such a pretty little glade on the shores of the sound between two hills. It was wooded, and our tents were under the trees. I looked around and thought what a lovely spot it was.

I thought I had some washing to do for the baby, so I went to the creek where it broadened out a little. There was a nice clean gravel spot, so I put the baby and the clothes down. I noticed I had forgotten the soap so I started back to the tent. The baby stood near the creek throwing handfuls of pebbles into the water. I got my soap and came back, and my baby was lying face down in the water. I pulled him out but he was dead. I awakened then, sobbing and crying. What a wave of joy went over me when I realized that I was safe in bed and that he was alive. I thought about it and worried for a few days, but nothing happened and I forgot about it. During that summer some friends asked the children and me to go camping with them. We cruised along the sound until we found a good place for a camp near fresh water. The lovely little glade between the hills had a small creek and big trees to pitch our tents under. While sitting on the beach with one of the other women, watching the children play, I happened to think I had some washing to do, so I took the baby and went to the tent for the clothes. When I got back to the creek I put down the baby and the clothes, and then I noticed that I had forgotten the soap. I started back for it, and as I did so, the baby picked up a handful of pebbles and threw them in the water. Instantly my dream flashed into my mind. It was like a moving picture. He stood just as he had in my dream--white dress, yellow curls, shining sun. For a moment I almost collapsed. Then I caught him up and went back to the

beach and my friends. When I composed myself, I told them about it. They just laughed and I said I imagined it. That is such a simple answer when one cannot give a good explanation." [5]

Anecdotes, though dramatic and numerous, do no more than convince one that precognitive dreams are a possibility. It takes scientific investigation to convert possibility to probability approaching certainty. Fortunately, there are perhaps half a dozen scientific demonstrations of dream telepathy.

The most famous among these were the experiments in dream telepathy carried out in the Dream Laboratory of the Maimonides Hospital in Brooklyn by Dr. Montague Ullman and Dr. Stanley Krippner in the late 1960s. These dream researchers monitored sleeping subjects. During the periods that the subjects were in REM sleep, a person in another room focused on an art reproduction and attempted to telepathically transmit an image of the painting to the sleeping subjects, who were awakened for dream reports at the end of each of their REM periods. Afterwards, judges were able to match which picture went with which dream report with an accuracy significantly above chance.

One night the target picture was The Sacrament of the Last Supper by Salvador Dali. The painting shows Christ at the center of a table surrounded by the twelve disciples, with a glass of wine and a loaf of bread on the table, and a fishing boat visible in the distance on the sea behind them. Dr. William Erwin was the subject. His first dream was about an ocean which he commented had a "strange beauty about it..." Remembering his second dream, he said, "boats come to mind. Fishing boats. Small-size boats...There was a picture in the Sea Fare Restaurant that came to mind...It shows, oh, I'd say about a dozen or so men pulling a fishing boat ashore right after having returned from a catch." Erwin's third dream seemed to relate to the Christian theme: he was looking through a "Christmas catalogue." His following three dreams were about doctors (Christ the healer and spiritual physician?) His last two dreams of the night dealt with food. In the morning Dr. Erwin's reflections on his dreams put the pieces together in a way that is very suggestive: "The fisherman dream makes me think of the Mediterranean area, perhaps even some sort of Biblical time. Right now my associations are of the fish and the loaf, or even the feeding of the multitudes....Once again I think of Christmas...Having to do with the ocean-water, something in this area..." [6]

The findings of the Maimonides program of research offer scientific support for the possibility of telepathic influence on dream content. [7] Likewise, in 1962, L. E. Rhine concluded on the basis of a large body of anecdotal evidence that more spontaneous psi-experiences occurred during dreaming than during the waking state. That being so, we may accept dream telepathy as a working hypothesis and are free to make explanatory use of it, if the need arises--which it shortly will.

But now let us return to the other enigma we were discussing: the out-of-body experience. The OBE takes on a confusingly wide variety of forms. A person having an OBE may for example find his sense of identity apparently associated with a second, non-physical body--a "soul," "astral body," "spirit," or, to suggest a term having a certain charm, "out-of-body body" (OBB)! Equally, while "out-of-body", one may entirely dispense with the inelegance of bodies of any sort, and experience oneself as a point of light or a freely mobile center of awareness. In some OBEs, one will seem to see one's physical body while in other cases one finds but an empty bed or someone else entirely.

Let us take the case of one "astral projector" who wrote that before he knew what his OBEs were, he "was much afraid each time" he had one. He explained that his projections always began with him lying in bed, feeling a weight holding him down. The next thing he knew he would be out

of his body. During one OBE, he walked around his bedroom and looked down the stairs into the kitchen. He decided to look at himself in the mirror, but curiously could not see anything when he did so. On another occasion, when returning from "astral adventures," he thought, "I'll look at myself on the bed." But when he looked, he saw his mother, who "had been passed over quite a long time." Yet curiously, finding his dead mother in bed instead of his sleeping body didn't lead him to the conclusion that he was dreaming; he took this to mean that his mother's spirit would always be with him whenever he was "projected." [8]

Two features of this OBE report are particularly suggestive. One is that upon "leaving his body" the astral projector walked around "his bedroom" and looked into "the kitchen." This added to the second fact that he expected to find his own sleeping body in bed upon his return, indicates that he conceived of himself as being in a non-physical ("astral") body, but in an environment identical to the physical world. It is exactly this kind of contradictory and confused mixture of mental and material elements that is also characteristic of the pre-lucid or naive dreamer. Secondly, note the projector's failure to consider the possibility that if his physical body wasn't in the bed he was looking in, it might not be the real bed he was looking at, or the real bedroom, or the real kitchen, either.

These kinds of minor lapses of rationality and the failure to question the anomalies that confront one seem to me quite characteristic of non-lucid dreaming and OBEs. Here is an account by Keith Harary, a person who has impressed me in the waking state as quite rational and of superior intelligence, and who is, as well, unusually proficient at inducing OBEs:

"One night I awoke in an out-of-body state floating just above my physical body which lay below me on the bed. A candle had been left burning on [sic] the other end of the room during the evening. I dove for the candle head first from a sitting position and gently floated down toward it with the intention of blowing out the flame to conserve wax. I put my "face" up close to the candle and had some difficulty in putting out the flame. I had to blow on it several times before it finally seemed to extinguish. I turned around, saw my body lying on the bed and gently floated back and back into it. Once in the physical (body) I immediately turned over and went back to sleep. The next morning I awoke and found that the candle had completely burned down. It seemed as if my out-of-the-body efforts had affected only a non-physical candle." [9]

The fact that Harary considered the other objects as physical, and the candle alone to have been non-physical is very similar to the way that normal dreamers account for anomalies when they occur during a dream.

Harary claimed that this experience, like his other OBEs, was "subjectively distinguishable from dreaming in much the same way that waking consciousness is distinguishable from dreaming or imagination." This is exactly how lucid dreams are distinguished from ordinary dreams.

In addition to the anomalies that people tend to accept in OBEs, there is another similarity to dreaming. This is the fact that during the OBE, they are convinced that what they are experiencing is actuality. For example, the gentleman with the "astral mother" whose case we have just discussed testified that he had learned through his OBEs that "the real Me is apart from and working through, my physical body. I now know for sure that we have two bodies."

This feeling of knowing "for sure" is quite characteristic of the tenacity with which people cling to the conclusions they draw from their out-of-body experiences. Wherever else they may differ, for instance whether the "two bodies" are or are not connected by a "silver cord," persons who have had out-of-the-body experiences are quite unanimous in being 'absolutely certain' that they are not

dreams. Yet during ordinary dreams we are usually convinced at the time of the actuality of what we later discover to have been delusions.

An example of one of my own experiences is, I believe, especially revealing in regard to the similarities between dreaming and OBEs. Previously, I had had several lucid dreams in which I dreamed I could see my "sleeping body" in bed. I refer to them as "lucid dreams" rather than "OBEs" because that is how I interpreted them at the time. In my opinion "lucid dreams" and "OBEs" are necessarily distinguished by only one essential feature. This is how the person interprets the experience at the time. The primary qualification for an OBE is the sensation that a person is out of his or her body. Perhaps it would be less misleading to describe this experience as an "out-of-body sensation" (OBS) rather than an "out-of-body experience." So, if you believe, in some sense, that you are "out of your body," you are having, by definition, an "out-of-the-body" experience. This definition sidesteps the question of whether or not you have actually left your physical body. However, no experience guarantees the actual existence of the thing in question. In the dark forest, one may experience a tree as a tiger, but it is still in fact only a tree.

According to the traditional psychology of Tibetan Buddhism, all of our experiences are subjective, and thus, by their very nature, not in substance different from what we call "dreams. " This is also the point of view of the cognitive psychology of the modern West. Granting this premise, and scientifically speaking, it is impossible to argue with it, it would be difficult to name any experience that (by this definition) was not a sort of dream.

Consequently my assumption that OBEs were necessarily a certain species of dream, made the following experience all the more startling: aware that I was dreaming, the image of what I had been dreaming about faded, but I tried to hold onto it. Throwing myself into the darkness, I found myself crawling down a dark tunnel on my hands and knees. At first, I could see nothing, but when I touched my eyelids I was able to open them, and I suddenly found myself floating across the room toward Dawn, who was sleeping on the couch. I looked back to see my 'body' asleep on the living room floor. Somehow, I was completely convinced that this was not a dream, but that I really was seeing my sleeping body. Dawn awoke and started to speak and I felt myself magnetically drawn back into the body asleep on the floor. When I arrived, I got up in this body (which I took to be my physical body) and excitedly said to her, "Do you know what just happened to me? An Out-of-Body Experience of the genuine kind!" After this I was looking through a stamp book, when I found myself flying (like Superman) in the air over Germany.

I was shocked to awaken a few minutes later in my bed, and realize that I had been sleeping all along. By now my brain was working well enough to note the general implausibility of my previous interpretation of the recent events I had experienced. I could see, for instance, the inconsistencies implied by my belief that the body I had seen asleep on the floor, and entered from my supposed "other body" was actually my physical body. Were it not for the physical impossibility of traveling to Germany once I had opened a stamp book (though I owned nothing of the kind), and the contradictory waking testimony of Dawn, I might still be convinced that what had happened was not a dream. And this in spite of all 'reason' to the contrary. What we know for certain, reason is powerless to doubt. When you see your hand in front of you, can you really doubt that it is your hand? What we know for certain actually only means what we assume or believe we know. My "out-of-the-body experience of the genuine kind" serves as a reminder that we can be totally mistaken about what seems indubitable and certain.

The lucid dream is sometimes considered to be an inferior form of the out-of-body experience. But I believe the opposite may be the case, as may have already occurred to those readers who followed the progression of stages through which children pass in developing understanding of the concept of "dreaming". To briefly review what was said in Chapter 6, recall that at the earliest stage, children believe that dreams take place in the same (external) world as the rest of their experiences. Having learned, mainly through their parents, that dreams are somehow different from waking experiences, at the next stage they treat dreams as if they were partially external and partially internal. This transitional stage finally gives way to the third stage in which children recognize that the dream is entirely internal in nature, i.e., a purely mental experience.

These developmental stages refer, of course, to the conceptual terms with which children think about the dream after awakening. While dreaming, children and adults alike tend to remain at the first stage: implicitly assuming that the dream events are external reality. Likewise, "astral projectors" who explicitly believe that what they are experiencing is external reality would be at this same stage. However, most typical out-of-the-body experiences with their somewhat contradictory mixture of mental and material would seem to provide examples of the second stage. Only with the fully lucid dream does the dreamer arrive at the third stage of conceptual clarity: realizing that the experience is entirely mental and clearly distinguishing the dream from the physical world.

In support of the notion that OBEs are generally the result of a misinterpreted dream experiences, let me offer a personal observation. In about 1% of the approximately 800 lucid dreams in my record, I felt I was in some sense 'out-of-my-body.' In every case, when examining the experience after awakening, I noted some deficiency in either my memory or critical thinking during the experience. In one such situation, I tried to memorize the serial number of a dollar bill to verify later whether I had really been out of my body or not. When I awoke, I couldn't recall the number, but it hardly mattered. I now remembered that I hadn't lived in the house I thought I was asleep in for several years. In another instance, I was floating near the ceiling of my living room "looking at some photos on top of a cabinet that I knew I hadn't seen before, given by habitual confinement to walking on the floor rather than the ceiling! My hopes of verifying this paranormally gained information evaporated in a flash when I remembered upon awakening that I hadn't lived in this house for more than 20 years!

In contrast, during most of my lucid dreams I can remember where I am sleeping (if it matters) and usually have as accurate a notion of the date as I normally have while awake. Frequently, I know what time it is within a few minutes.

From this I suggest that imperfect brain function during REM sleep may at times give rise to incomplete lucidity during dreaming. This state is characterized by partial amnesia, inadequate reality testing, and interpreting the experience as being out-of-body rather than dreaming.

All in all, the quality of reasoning during OBEs seems to me to closely resemble Nietzsche's description of the reasoning typical of primitive humanity and also of dreamers today: "the first causa which occurred to the mind to explain anything that required an explanation was sufficient and stood for truth." [10] This pre-critical stage of mind is also typical of the explanations many pre-lucid dreamers accept as proof that they are not dreaming. I believe a similarly stage of mind characterizes the reasoning whereby people convince themselves that they really are "out-of-body."

In fairness, it should be pointed out that the manner in which OBEs are typically initiated makes the "out-of-body" interpretation of the experience seem almost beyond questioning: you are apparently awake in bed, and then, with no more notice than a feeling of vibration or melting, you find

yourself "peeling," "stepping," or "floating" "out of the body." Most people accept uncritically that what seems to be the natural explanation is the explanation of the experience.

In accordance with Nietzsche's contention above,, "leaving one's body" is the first causa to occur to the dreaming mind, and it is accepted on face value as the explanation. One of the reasons people might be likely to label an experience like we've just described as "out-of-the body" rather than dreaming is because it seemed to happen while they were awake. Obviously, if they were asleep, they couldn't have been dreaming, and if they weren't dreaming, they must have been doing what it seems they were--being "out-of-the-body."

This all seems straightforward enough, except for one awkward fact: it happens that in a variety of circumstances, it may be extremely difficult to determine whether or not you really are asleep or awake, only dreaming or really seeing. These states of confusion are especially likely to occur during sleep paralysis, a condition that sometimes results when a person partially awaken from REM sleep and finds himself unable to move, because the part of the brain that prevents them from acting out their dreams for some reason temporarily continues to function even though they are otherwise "awake." Although the physiological basis for sleep paralysis has only recently been uncovered, the state and the hallucinatory experiences associated with it have been known for many years. For example, Eleanor Rowland described some of her experiences of this confusing blend of dream and reality in a 1908 paper entitled "A case of visual sensations during sleep":

"It often happens that dream persons issue from behind a real door, a dream hand moves along a real wall, and a dream figure sits upon the real bed. Since my vision is so accurate, I can not reassure myself by being certain that I am asleep. Nor am I in a slumber deep enough to accept any dream that comes without comment. My reasoning powers are active at such times, and I commune thus with myself: "No one can have opened the door, for you know you locked it." "But I see a figure distinctly standing at my elbow, and it has knocked on the door twice." "You are probably asleep." "How can I be? I see and hear as distinctly as I ever do." "Why then, don't you push the figure away?" "I will. Here I am doing it." "No--you are not doing it at all, for you can see that you have not moved an inch." "Then I am asleep after all--the figure is not there, and I need not be afraid of it." [12]

The lesson to be learned from all this is that it is not always easy to determine which world you are living in at any given time: telling dreams from reality is no easy matter. Neither biological nor cultural evolution has prepared you to any significant extent for this particular task. Distinguishing one state of consciousness from another is a cognitive skill learned in exactly the same way that you learned as children to comprehend the gibberish of sounds that became your native language--by practice. The more practice you gain in lucid dreaming, the easier you will find it not to be fooled into thinking you are awake when you are dreaming. The more experience you have had with recognizing false awakenings, sleep paralysis, and other phenomena associated with REM sleep, the more likely it is that when you "leave your body" you will recognize it as a lucid dream.

This, in fact, is what we have observed with most of our experienced oneironauts. They quite frequently describe lucid dreams initiated from brief awakenings within REM periods as "leaving their bodies " even though we all agree that while this terminology effectively captures the way the experience actually feels at the time, it does not presumably describe what really happens.

As an example of the peculiar form typically taken by these experiences, consider one of Roy K.'s laboratory lucid dreams: while lying on his right side, he began turning to the left and felt as though he had "left his body." He saw a scene of a field and signaled lucidity about seven times. Next ap-

peared a glowing, reddish light, so he turned to the right towards it, and flew down an alley. At this point, he resumed signaling although he was later unsure of exactly how many times he had moved his eyes. It might have been nine. In any case, he continued to fly down the alley until he saw the moon--full and strikingly luminous. Upon seeing the stars above, he decided to try to unite them with the moon. But it was too late. Already he felt his body paralyzed in bed. He wanted to wake up and signal someone, and after what seemed like a very strenuous effort, succeeded in awakening and pressed the call button.

Before I offer an explanation for what I believe may actually be happening in experiences of this kind, I would like to describe one of my own wake-within REM initiated lucid dreams. It was the middle of the night, and I had evidently just awakened from a REM period since I effortlessly recalled a dream. I was lying face down in bed, drowsily reviewing the story of my previous dream when I suddenly experienced a very curious sensation of tingling and heaviness in my arms. They became so heavy, in fact, that one of them seemed to melt over the side of the bed! I recognized this distortion of my body image as a sign that I was re-entering REM sleep. As I relaxed more deeply, I felt my entire body become paralyzed although I could still seem to feel its position in bed. I reasoned that this feeling was most likely a memory image and that actual sensory input was cut off just as much as motor output. I was, in short, asleep. At this point, I imagined raising my arm and experienced this imagined movement as if I had separated an equally real arm from the physical one I knew to be paralyzed. Then with a similar imagined movement I, as it were, "rolled out of my physical body entirely." I was now, according to my understanding, wholly in a dream body in a dream of my bedroom. The body I had seemed to leave and which I now dreamed I saw lying on the bed, I quite lucidly realized to be a dream representation of my physical body; indeed, it evaporated as soon as I put my attention elsewhere. From here, I flew off into the dawn....

I would say that having awakened from REM sleep, I was (as always) experiencing my body image in a position calculated by my brain. Since this calculation was based on accurate information about the physical world obtained through my awake (and therefore functional) senses, my experienced body position corresponded to my actual situation of lying in bed. Since during sleep (particularly REM), sensory input from the external world is actively suppressed, at this point my sensory systems no longer provided my brain information regarding the physical world. Thus my brain's representation of my body-image was no longer constrained by sensory information concerning my body's actual orientation in physical space. I was consequently free to move my body image in mental space out of the position it was represented as being in when last in sensory contact with the physical world. I could in fact now move this image to any new position in mental space that I chose. With no sensory input to contradict any imagined position of my body image that my brain cared to construct, I could freely "travel" anywhere in mental space.

Let us consider, for comparison, an alternative theory: OBEs as "astral projection." The idea of the astral world was brought to the West and popularized by Madame Blavatsky in the last century. According to her doctrine of Theosophy, the world is composed of seven planes of existence: each plane is made up of atoms of varying degrees of refinement. The physical world is the coarsest of all. On the next higher level, the so-called "etheric" plane, we find a second body--but this is not yet the "astral body," only the "etheric body" normally attached to the physical body and serving to keep all seven bodies in communication. The next higher plane is the "astral" where we find the body we have been looking for. The astral world is made of "astral matter" which is superimposed on physical matter, and everything in the physical world has its counterpart in the astral world. However, there are more things found on the astral plane than on the physical including a menagerie of spirits and elementals and discarnate entities of all sorts. What is most to the point here is that the astral body was supposed to be able to travel on the astral plane free of the physical body,

and since the astral was supposed to contain a copy of everything in the physical world, it would have seemed an easy matter to gain information from distant places by speedy travel on the astral plane. There are many difficulties with the "astral world" theory of dreaming and OBEs. Just to name one, I can recall lucid dreams in which I viewed a dream representation of my bedroom that was missing a good deal of "astral" matter: a whole wall and window in fact! But my intention here is not to expound the theory of astral projection, but only to translate their terms into mine.

What occultists have termed "astral travel," I am calling "mental travel". Moreover, instead of "astral world," I say "mental world"; and as for the mysterious entity elsewhere referred to as the "astral body", "double", or "phantom", or "second body", I regard it as an experiential reality that I have identified with the body image, but the most straightforward term for it may be "the dream body."

This dream body is our mental representation of our actual physical body. But this is the only body that we ever directly experience. We know by direct acquaintance only the contents of our minds. All of our knowledge concerning the physical world, including even the assumed existence of our "first" or physical bodies, is by inference.

Just because our knowledge of external reality is indirect, it should not lead us to conclude that mind alone exists or that the physical world is merely an illusion. Due to its representational nature, it is our mental world that is the illusion. Our mental experiences can be compared to watching television. The televised events are merely projected pictures having only the semblance of reality. Whether or not the events we see on television have any correspondence with actual events is another matter. When, for instance, we watch a news program we trust we are witnessing the depiction of events that actually occurred in physical reality. If we have seen a man killed we expect him to be in fact--dead. In contrast, when we see an actor "killed" in a television melodrama, we consequently expect him rather than his widow to collect his pay check!

In both of these cases, what we experienced were illusions in the sense that the events that apparently took place on our television were only the images of events that may or may not have actually occurred in external reality. This is the necessary condition of all of our experiences: as mental representations, they are the images of the things they represent--not the things themselves. It is much more informative to specify the relation between the image and the thing it represents. Our two examples represent opposite degrees of possible correspondence. In the case of the actor, there was no relationship between the theatrical "death" portrayed and actuality. In contrast, the news program showed us the image of an event that precisely corresponded to the occurrence of an actual event. Thus we accept the news as accurately expressing reality. One can easily imagine television productions possessing degrees of truth anywhere between the two extremes we have considered, such as a dramatic enactment of a true story or a news program that mistakenly reported that a man had been killed when he had in fact only been wounded.

Now imagine a person confined to a room whose entire experience of the outside world is limited to what he or she sees on television. Such a person might well regard television as the primary reality and "the outside world" as a derivative and unnecessary hypothesis.

I am suggesting by this metaphor that we are all in a very similar situation: the room we are confined in corresponds to our minds, and the television programs to the news and fantasies of the external world, brought to us by our senses. All of the foregoing discussion in reference to television images equally applies to the mental images out of which we construct our worlds.

In the terms I have proposed here, being in the body means constructing a mental body image. Because it is based on sensory information, it accurately represents the body's actual position in

physical space. While dreaming, we are out of touch with our bodies and consequently liberated from the physical constraints imposed by waking perception. Thus no awkward sensory facts are present to limit our movement in mental space, and we are free to move out of the spatial orientation defined by "being in the (physical) body."

The part of us that "leaves the body" travels in mental, not physical space. Consequently, it would seem reasonable to suppose that we never "leave our bodies" because we are never in them. Where "we" are when we experience anything at all--OBEs included--is in mental space, not physical space. Milton's famous phrase, "The Mind is its own place," goes not quite far enough. The mind is not merely its own place, the mind is its only place.

We are ready to address an empirical aspect of the OBE phenomenon. Persons undergoing OBEs frequently believe they are paranormally perceiving happenings taking place in the physical world. Unfortunately, in most cases, this belief takes the form of an untested assumption. Like the events we see on television, what we see during OBEs could have any degree of correspondence with physical reality.

The generally unquestioned assumption underlying OBEs is that the person having the experience is actually situated, in some unexplained way, elsewhere in the physical world than in his or her physical body. An implication of this is that what the person sees while "out-of-the-body" ought to be an accurate reflection of physical reality, entirely analogous to ordinary perception. Rarely are either of these assumptions subjected to rigorous test or, for that matter, to any test at all. These are empirical questions that can and should be settled by scientific experiment.

Are there any scientific data that might allow us to arrive at a verdict on the claim that OBE vision is valid? There is in fact a good deal of relevant evidence available and there have been a number of studies of OBE vision that meet the standards of rigorous control required by exact science.

There are two ways of broadly viewing the results of these studies. First of all, we have the summary of Karlis Osis, Director of Research at the American Society for Psychical Research (A.S.P.R.). This society, in an effort to produce evidence for survival of death, undertook an extensive investigation of OBE perception. [13] In the course of this study, approximately 100 subjects, all of whom believed they were proficient in inducing OBEs and possessed paranormal perceptual abilities during these OBEs, were tested under controlled conditions. While confined to one room at the A.S.P.R., the subjects induced OBEs and "visited" a distant target room, attempting afterwards to describe in detail what they had "seen" while there. A comparison of their reports with the actual contents of the target room revealed, in all but a few cases, absolutely no indication of any correspondence whatsoever. In other words, in the great majority of these cases, there was no evidence supporting accurate OBE perception, nor for the validity of the subjects' convictions that they had actually left their bodies. Moreover, these subjects were described by Osis as being "the creme of the claimants" of OBE. I believe the results of this study strongly supports the "OBE as misinterpreted lucid dream" interpretation offered above.

As for OBE vision, in the words of Dr. Osis, "the bulk of the cases seem to be a mirage." At best, OBE vision seems a highly variable and unreliable mode of perception "ranging from fairly good (i.e., clearly distinguishing some objects) to complete failure (i.e., producing very foggy or totally incorrect images)." Moreover, Osis added, "of those individuals in our studies who have shown some signs of OOB perceptual power, we did not find a single one who could see things clearly every time he felt he was out of body."

The great majority of alleged cases of OBE vision apparently show no greater degree of perceptual ability (in regard to the external world) than we would expect from ordinary dreams. This might by itself suggest that the nature of OBEs would require no additional explanation than that already discussed.

But the existence of even occasional exceptions of apparently accurate OBE perception is a fact that still needs to be explained. The traditional explanation holds that OBE vision is a form of direct perception by means of the senses of a non-physical body. There is an alternative explanation that is philosophically sound, economical, and (most importantly) in agreement with observation. It does not in the first place assume a condition of unvarying accuracy during OBE or lucid dream vision. Instead, it suggests that like all other mental imagery, this form of perception may be relatively more accurate at some times than others. Mental experiences can be ordered on a spectrum ranging from little or no relation to external reality (e.g., "hallucinations") at one end, to near perfect correspondence with actuality (e.g., "perception") on the other end. Moreover, there can be any degree of relationship in between, and it is somewhere in this middle ground that dreams and OBEs generally reside.

What I am proposing is that the select minority of accurate OBE reports are simply cases of dream telepathy. To some people, this may seem like explaining the mysterious in terms of the more mysterious. Dream telepathy is a fact only barely established and in no way satisfactorily understood or explained. A question for future research is whether lucid dreamers and OBErs are more conducive to telepathy than ordinary dreamers.

Taking together the out-of-body experiences with which we have become familiar, they do no seem to have lived up to the claim that they would "challenge our most basic assumptions concerning the nature of reality." Perhaps only dream telepathy so far has provided us, so far with any significant fact of the kind that makes us ponder deeply or gaze into the starlit night. I have saved for last what may be the most mysterious of the reality-shaking phenomena of the world of dreams: I am referring to what are variously called "mutual," "reciprocal," or "shared" dreams.

These are the perplexing experiences in which two or more people report having had similar if not identical dreams. In some of these cases, the reports are so remarkably alike that one is almost compelled to conclude that the dream sharers appear to actually have been present together in the same dream environment. If this does occur, it would imply that at least under certain cases the dream world and likewise the dream bodies within it could possess some sort of objective existence. On the other hand, in mutual dreams we may only share dream plots, not the dreams themselves. Let us examine a classical account of ostensible "reciprocal dreaming."

In Elmira, New York, on Tuesday the 26th of January, 1892, between 2 and 3 A.M., Dr. Adele Gleason dreamed that she stood in a lonesome place in the dark woods and that great fear came over her, at which point she dreamed that John Joslyn, her attorney and friend, came to her and shook a tree by her, causing its leaves to burst into flame. When the two friends met four days later, Adele mentioned having had a "strange dream" last Tuesday night. John stopped her at once replying, "Don't tell it to me. Let me describe it, for I know that I dreamt the same thing." At approximately the same time on Tuesday night as Adele's strange dream, John had awakened from a no less strange dream of his own and written down the following remarkably similar account: he had found Adele in a lonely wood after dark, "apparently paralyzed with fear of something I did not see, rooted to the spot by the feeling of imminent danger. I came up to her and shook the bush, upon which the leaves that fell from it burst into flame." [14]

Although these two dream reports are remarkably similar, they are not quite identical. For example, Adele made a tree of what for John was only a bush; Adele's leaves burned on her tree, while John's turned to flame while falling. The original reports show other discrepancies as well. I would interpret this as an instance of shared dreaming as caused by Adele's telepathic transmission to her friend of an s.o.s., along with the highly-charged imagery of her dream. John, for his part, responded in his dream to his friend's call for help, by telepathically initiating and sharing a visionary experience strikingly reminiscent of the Burning Bush of Moses. This is a truly amazing tale of two dreams, yet it does seem to me to more strongly support the hypothesis of shared dream plots rather than shared dream worlds.

A somewhat more convincing anecdote is provided by Oliver Fox: "I had been spending the evening with two friends, Slade and Elkington," wrote Fox, "and our conversation had turned to the subject of dreams. Before parting, we agreed to meet, if possible, on Southampton Common in our dreams that night." Later that night, Fox claimed that he dreamed that he met Elkington on the common "as arranged." So far, so good, "but Slade was not present." According to Fox, both he and Elkington both knew they were dreaming, and commented on Slade's absence. "After which the dream ended, being of very short duration." Fox tells us that when he saw Elkington the next day he kept quiet and asked him whether he had dreamed. "Yes," Elkington replied, "I met you on the Common all right and knew I was dreaming, but old Slade didn't turn up. We had just time to greet each other and comment on his absence, then the dream ended." This, to Oliver Fox's mind, "perhaps accounted for" Slade's "inability to keep the appointment." What happened to Slade? Fox was able to settle the mystery to his own satisfaction at least. When they finally found Slade and asked him what happened, he replied that he "had not dreamed at all." [15]

Intriguing as this particular case appears, it is marred by Fox's failure to report the exact time of occurrence of the two lucid dreams. Although the dreams are described as occurring on the same night, if they happened at different times (i.e., if Fox and Elkington were not in REM sleep at the same time), it would favor the hypothesis of shared dream plots over being in the same dream at the same time. In any case, Fox was unable to repeat "this small success" in mutual lucid dreaming and expressed the belief that "it is an extremely rare occurrence for two people to share approximately the same dream experience."

The examples we have so far considered were both once-in-a lifetime experiences for the dream sharers. In contrast, there are suggestions that mutual dreaming abilities have been cultivated to a high level by a number of Sufi mystics. Aside from various stories of Sufi masters being able to appear in the dreams of anyone they chose, there is the report of a group of dervishes who explored the world of dreams on the island of Rhodes in the 16th Century. [16] The dervishes were presided over by a Sheikh, "a certain Hudai effendi" who not only "practiced all the virtues, cultivated all the sciences and read books in the majority of Classical languages" but "devoted himself to the cultivation of collective dreams." In an isolated monastery atop a small hill on the island, "master and disciples purified themselves bodily, mentally and spiritually together; they got into an enormous bed together, a bed which contained the whole congregation. They recited the same secret formula together and had the same dream."

A remarkable story is told of an encounter between the dream master of Rhodes and Suleiman the Magnificent, the Sultan of Turkey. One day, during a military campaign in Corinthia, Suleiman found himself in a seemingly impossible dilemma. Neither the Grand Vizier nor any others of the Sultan's corps of advisors could devise any plan of action whatsoever.

Fortunately, the Sultan remembered that there was still an emissary of Hudai effendi in his camp. Since the dream-master had helped him in the past out of no less difficult circumstances, Suleiman summoned the dervish, and providing him with travel expenses, and safe conduct passes, asked him how many weeks he would need to journey to Rhodes and return to the Imperial camp with the Sheikh.

"The dervish gave an involuntary smile. 'Sire,' he replied, 'I thank you for the travel expense and the safe-conducts. I have no need of them. True, to the vulgar the island of Rhodes is far from here, but the venerated Sheikh Hudai is no distance from Your August Highness's camp. I undertake to summon him tonight, even before morning prayers.'"

Misunderstanding the nature of the Sufi's nearness, the Sultan was "astonished at the holy man's presence in the neighborhood of his camp," and gave the dervish purses full of gold and silver, but he refused them. In return, the dervish offered Suleiman a "soporific apple" which the Sultan peeled and ate.

"Then the mysterious man went so sleep," as did the Sultan also. Previously he had ordered him men to awaken him at the arrival of Hudai effendi. But when the master failed to appear, they laughed at the dervish and mocked their "Sovereign's credulity and senility." When at dawn the muezzin of the army began the morning call to prayer, The Great Eunuch gently awoke the Emperor and after wishing him good morning as well as a brilliant victory over the enemy, whispered ironically: "Sire, no news of Sheikh Hudai effendi. It looks as if his disciple is a fraud."

"Silence, you utter imbecile," roared the Sultan, "silence! The illustrious Master has deigned to visit me. I have had a long conversation with him and I tell you that my faithful armies have won the most brilliant of victories, less than an hour ago. Await the messenger's arrival." The enemy commander had passed out just at a crucial moment as the battle was about to begin and his subordinates were unable to carry on without him, with the result as foretold by the Sultan via Sheikh Hudai.

Evidently, "at a dream signal from the humble disciple" Hudai effendi had visited and advised Suleiman--in a dream! Moreover, there is the suspicion that the dream master may have been somehow involved in the enemy commander's mysterious and for him ill-timed loss of consciousness which resulted in what would seem "the most accidental" in spite of being called "the most brilliant of victories" for the armies of Suleiman the Magnificent.

Fascinating as this and other anecdotes of mutual dreaming may be, they bring us no nearer to deciding between the competing interpretations of actually shared objective dream-worlds vs. paranormally shared but subjective dream-plots, resulting in correlated content in separate dreams. One might wonder whether there is any way that the question could be definitely settled. I propose that there is in fact an empirical test that could distinguish between the two possibilities: two oneironauts would have simultaneous lucid dreams while being monitored in a sleep laboratory. They would agree to meet in their lucid dreams and signal simultaneously by, for example, both following with their gaze the movement of one of their hands, back and forth, left and right. If the strong interpretation is of mutual dreams, i.e., if the lucid dreamers are actually sharing a dream-world, they would show simultaneous eye-movement signals in their polygraphic recordings. If on the other hand, they report carrying out this task in a mutual lucid dream and do not show simultaneous signals, we would have to conclude that they were at most sharing dream plots. Let us be sure to appreciate the significance of such an experiment. If the mutual lucid dreamers fail to show simultaneous signals, it would be neither surprising or especially significant. However, if the mutual

lucid dreamers did prove to produce simultaneous eye movement signals, we have incontrovertible proof for the objective existence of the dream world. We would then know that, in certain circumstances at least, dreams can be as objectively real as the world of physics. This would finally raise the question of whether physical reality is itself some kind of mutual dream. Perhaps what really happens is the balanced result of a myriad of interactions contributed by us all dreaming the dream of consensus reality. But if not, then there's always Bob Dylan's offer: "I'll let you be in my dream, if I can be in yours."

NOTES

[1] Nietzsche, F. HUMAN, ALL TOO HUMAN, aphorism #5.[2] Celia Green (1967) asked two samples of undergraduates from two British universities whether they had ever had an "experience in which you felt you were 'out of your body'"? She received 19 percent positive responses out of 115 in the first sample and 34 percent positive responses out of 380 in the second. Hornell Hart (1954) received 27 percent positivereplies from 155 Duke University sociology students, while Charles Tart (1971) received 44 percent positive responses from 150 experienced marijuana users. In D. S. Rogo [Ed.], MIND BEYOND THE BODY. New York: Penguin, 1978, p. 36.[3] Rhine, L. E. Psychological processes in ESP experiences. Part II. Dreams. JOURNAL OF PARAPSYCHOLOGY, 26:172-199, 1962.[4] Sheils, D. A cross-cultural study of beliefs in out-of-the-body experiences, waking and sleeping, JOURNAL OF THE SOCIETY FOR PSYCHICAL RESEARCH, 49:697-741, 1978.[5] Priestly J.B. MAN AND TIME. Aldous Books, 1964, p. 225-6.[6] Ullman M., Krippner S. DREAM TELEPATHY. New York: MacMillan Publishing Co., 1973, p.111.[7] Of the 13 experimental studies carried out, 9 yielded statisically significant results. Replications in laboratories elsewhere yielded less consistent results: two were positive, three negative, and one equivocal.[8] Rogo, D.S., Introduction: Autobiographical accounts, from Rogo, D.S., (ed.), MIND BEYOND THE BODY (New York: Penguin, 1978), pp. 248-49.[9] Harary S.B. A personal perspective of out-of-body experiences. In Rogo, op. cit., p.248-9.[10] Ibid., p.356-7.[11] deBecker R. THE UNDERSTANDING OF DREAMS. London: Allen & Unwin, 1965, p.249.[12] Rowland, E. A case of visual sensations during sleep, THE JOURNAL OF PHILOSOPHY, 6 (1909): 353-57.[13] Osis K. Perspectives for out-of-body research. PARAPSYCHOLOGY RESEARCH. 3:110-13, 1973.[14] deBecker, op.cit., p. 394-95.[15] Fox O., ASTRAL TRAVEL. New York: University Books, 1962, p.47.[16] DeBecker, op.cit., p. 76-78.

[From: S. LaBerge & H. Rheingold, (1990). EXPLORING THE WORLD OF LUCID DREAMING. New York: Ballantine. ISBN 0-345-37410-X]

Chapter 6: Principles and Practice of Lucid Dreaming

HOW TO STAY ASLEEP OR WAKE UP AT WILL

So far you have learned how to increase your dream recall and various techniques for inducing lucid dreams. Perhaps you have succeeded in having a few lucid dreams, or perhaps you know how to induce them more-or-less at will. Now that you are learning to realize when you are dreaming, what can you do with this knowledge? As discussed previously, one of the most fascinating potentials offered by lucid dreaming is the ability to voluntary control dreaming. It may be possible to dream anything you choose, as the Tibetan dream yogis believe. But before you can try it, you need to be able to remain asleep and retain lucidity!

Novice lucid dreamers often wake up the moment they become lucid. They can recognize lucidity clues, apply state tests, and conclude that they are dreaming, but are frustrated because they wake up or fall into nonlucid sleep soon after achieving lucidity. However, this obstacle is only temporary. With experience, you can develop the capacity to stay in the dream longer. As you will see in a moment, there are also specific techniques that appear to help prevent premature awakening. If you continue to apply will and attention to your practice you should be able to refine your lucid dreaming skills.

PREVENTING PREMATURE AWAKENING

Informally experimenting in their beds at home, lucid dreamers have discovered various ways of remaining in the dream state when threatened by early awakening. All the techniques involve some form of dream action which is carried out as soon as the visual part of the dream begins to fade.

Linda Magallon, editor and publisher of the Dream Network Bulletin, and an intrepid explorer of lucid dreams, has described how she prevents herself from waking up by concentrating on the senses other than vision, such as hearing and touch. She reports that all of the following activities have successfully prevented awakenings from visually faded dreams: listening to voices, music, or her breathing; beginning or continuing a conversation; rubbing or opening her (dream) eyes; touching her dream hands and face; touching objects such as a pair of glasses, a hair brush, or the edge of mirror; being touched; and flying. [1]

These activities all have something in common with the Spinning Technique described below. They are based on the idea of loading the perceptual system so it cannot change its focus from the dream world to the waking world. As long as you are actively and perceptually engaged with the dream world, you are less likely to make the transition to the waking state.

Magallon may be a dreamer with an unusually active REM system; it may be that she has little trouble staying asleep once she is in REM. However, many others are light sleepers who find it difficult to remain in lucid dreams for long periods of time. These people need more powerful techniques to help them stay in their lucid dreams.

Harold von Moers-Messmer, a German physician, was one of the handful of researchers who personally investigated lucid dreaming in the first half of the 20th century. He was the first to propose the technique of looking at the ground in order to stabilize the dream. [2]

The idea of focusing on something in the dream in order to prevent awakening has independently occurred to several other lucid dreamers. One of these is G. Scott Sparrow, a clinical psychologist and author of the classic personal account, LUCID DREAMING: DAWNING OF THE CLEAR LIGHT. [3] Sparrow discusses Carlos Castaneda's famous technique of looking at his hands while dreaming to induce and stabilize lucid dreams. [4] Sparrow argues that the dreamer's body provides one of the most unchanging elements in the dream, which can help to stabilize the dreamer's otherwise feeble identity in the face of a rapidly changing dream. However, as he points out, the body isn't the only relatively stable reference point in the dream: another is the ground beneath the dreamer's feet. Sparrow uses this idea in this example of one of his own lucid dreams:

"...I walk on down the street. It is night; and as I look up at the sky I am astounded by the clarity of the stars. They seem so close. At this point I become lucid. The dream 'shakes' momentarily. Immediately I look down at the ground and concentrate on solidifying the image and remaining in the dreamscape. Then I realize that if I turn my attention to the pole star above my head, the dream image will further stabilize itself. I do this; until gradually the clarity of the stars returns in its fullness." [5]

DREAM SPINNING

Some years ago I had the good fortune to discover a highly effective technique to prevent awakenings and produce new lucid dream scenes. I started by reasoning that since dream actions have corresponding physical effects, relaxing my dream body might inhibit awakening by lowering muscle tension in my physical body. The next time I was dreaming lucidly, I tested the idea. As the dream began to fade, I relaxed completely, dropping to the dream floor. However, contrary to my intention, I seemed to awaken. But, a few minutes later I discovered I had actually only dreamed of awakening. I repeated the experiment many times and the effect was consistent--I would remain in the dream state by dreaming of waking up. However, my experiences suggested that the essential element was not the attempted relaxation but the sensation of movement. In subsequent lucid dreams, I tested a variety of dream movements and found both falling backward and spinning in the dream to be especially effective in producing lucid dreams of awakening. Here is a method for spinning to remain in the dream state:

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THE SPINNING TECHNIQUE

1. Notice when the dream begins to fade

When a dream ends, the visual sense fades first. Other senses may persist longer, with touch being among the last to go. The first sign that a lucid dream is about to end is usually a loss of color and realism in your visual imagery. The dream may lose visual detail and begin to take on a cartoon-like or washed-out appearance. You may find the light growing very dim, or your vision becoming progressively weaker.

2. Spin as soon as the dream begins to fade

As soon as the visual imagery of your lucid dream begins to fade, quickly, before the feel of your dream body evaporates, stretch out your arms and spin like a top (with your dream body, of

course). It doesn't matter whether you pirouette, or spin like a top, dervish, child, or bottle, as long as you vividly feel your dream body in motion. This is not the same as imagining you are spinning; for the technique to work, you must feel the vivid sensation of spinning.

3. While spinning, remind yourself that the next thing you see will probably be a dream

Continue to spin, constantly reminding yourself that the next thing you see, touch or hear will very probably be a dream.

4. Test your state wherever you seem to arrive

Continue spinning until you find yourself in a stable world. You will either still be dreaming or have awakened. Therefore, carefully and critically test which state you are in (see Chapter 3).

COMMENTARY

If I think I have awakened, I always check the time on the digital clock beside my bed. This usually provides a foolproof reality test.

Frequently, the spinning procedure generates a new dream scene, which may represent the bedroom you are sleeping in, or some more unusual place. Sometimes the just-faded dream scene is regenerated in all its vivid glory.

By repeatedly reminding yourself that you're dreaming during the spinning transition, you can continue to be lucid in the new dream scene. Without this special effort of attention, you will usually mistake the new dream for an actual awakening--in spite of manifest absurdities of dream content!

A typical false awakening would occur if, while spinning, you felt your hands hit the bed and you thought: "Well, I must be awake, since my hand just hit the bed. I guess spinning didn't work this time." What you should think, of course, is "Since the spinning hand that hit the bed is a dream hand, it must have hit a dream bed. Therefore, I'm still dreaming!" Don't fail to critically check your state after using the Spinning Technique.

EFFECTIVENESS OF SPINNING

This method is extremely effective for many dreamers, including myself. Out of the one hundred lucid dreams in the last six months of the record in my doctoral dissertation, I used this technique in forty percent of my lucid dreams. New dream scenes resulted in eighty-five percent of these cases. Lucid consciousness persisted in ninety-seven percent of the new dreams. When spinning led to another dream, the new dream scene almost always closely resembled my bedroom.

The experiences of other lucid dreamers who have employed this method have been very similar to mine, but suggest that the post-spin lucid dream need not be a bedroom scene. One of these lucid dreamers, for instance, found herself arriving at a dream scene other than her bedroom in five out of the eleven times she used the spinning technique.

These results suggest that spinning could be used to produce transitions to any dream scene the lucid dreamer expects. (See Exercise: Spinning a new dream scene, later in this chapter) In my own case, it appears that my almost exclusive production of bedroom dreams may be an accident of the

circumstances in which I discovered the technique. I have tried, with very little success, to produce transitions to other dream scenes with this method. Although I definitely intended to arrive elsewhere than my dream bedroom, I cannot say that I fully expected to. I believe I will someday be able to unlearn this accidental association (if that is what it is). Meanwhile, I'm impressed by the power of expectation to determine what happens in my lucid dreams.

HOW DOES SPINNING WORK?

Why should dream spinning decrease the likelihood of awakening? Several factors are probably involved. One of these may be neurophysiological. Information about head and body movement, monitored by the vestibular system of the inner ear (which helps you to keep your balance), is closely integrated with visual information by the brain to produce an optimally stable picture of the world. Because of this integration of information, the world doesn't appear to move whenever you move your head, even though the image of the world on your retina moves.

Since the sensations of movement during dream spinning are as vivid as those during actual physical movements, it is likely that the same brain systems are activated to a similar degree in both cases. An intriguing possibility is that the spinning technique, by stimulating the system of the brain that integrates vestibular activity detected in the middle ear, facilitates the activity of the nearby components of the REM-sleep system. Neuroscientists have obtained indirect evidence of the involvement of the vestibular system in the production of the rapid-eye-movement bursts in REM sleep. [6]

Another possible reason why spinning may help postpone awakening comes from the fact that when you imagine perceiving something with one sense, your sensitivity to external stimulation of that sense decreases. Thus, if the brain is fully engaged in producing the vivid, internally generated sensory experience of spinning, it will be more difficult for it to construct a contradictory sensation based on external sensory input.

WHAT TO DO IF YOU DO AWAKEN PREMATURELY

Even if you find that despite your best efforts to stay asleep you still wake up, all is not lost. Play dead. If you remain perfectly motionless upon waking from a lucid (or non-lucid) dream, and deeply relax your body, there is a good chance that REM sleep will reassert itself and you will have an opportunity to consciously enter a lucid dream, as described in Chapter 4. For some people with a strong tendency to REM sleep, this happens almost every time they awaken from a dream until they decide to move. Alan Worsley is one of the world's most experienced lucid dreamers. He has been conducting personal lucid dream experiments since the age of five. During the 1970s, he was the first person to signal from a lucid dream in pioneering experiments carried out in collaboration with Keith Hearne. [7] Worsley appears to possess this felicitous sort of physiology, and offers the following advice for dreamers who have just awakened but yearn to return to their lucid dreams: "Lie very still--don't move a muscle! Relax and wait. The dream will return. I've had dozens of lucid dreams in a row with this method." [8]

USING INNER SPEECH TO PREVENT LOSS OF LUCIDITY

We have used language to control our thinking and behavior since we first learned to speak. Our parents would tell us what to do and how to do it and we were guided by their words. When we

first we did these things under our own direction, we would repeat out loud the parental instructions to remind ourselves of exactly how and what we were trying to do. Now, having fully incorporated the role of parental guide within us, we repeat the instructions silently to ourselves when carrying out complicated new procedures.

This process of verbal direction of conscious behavior can also be used to regulate your behavior in the lucid dream, for instance to maintain your awareness that it is a dream. Until becoming and staying lucid is a well developed habit, we are all too likely to lose lucidity anytime our attention wanders. The moment we take a bit too much interest in some facet of the dream, lucidity vanishes. If you are a novice lucid dreamer who has problems maintaining your lucidity, the temporary solution is for you to talk to yourself in your lucid dreams. Continually remind yourself that you are dreaming by repeating phrases like "This is a dream!...This is a dream!...This is a dream!" or "I'm dreaming...I'm dreaming...I'm dreaming...." This self-reminding can be spoken "out-loud" in the dream, if necessary. Otherwise it's better to say it silently to avoid the repetition becoming the predominant feature of the dream.

Sparrow recommends the same procedure, advising dreamers with shaky lucidity "to concentrate on an affirmation which serves as a continual reminder of the illusory nature of the experience." [9] Sparrow considers it essential that the affirmation (e.g., "This is all a dream") must be learned by heart and cultivated in the waking state in order for it to be an effective aid in the dream state.

After you have acquired some experience, you will learn to recognize the situations in which you tend to lose your lucidity (i.e., the presence of strongly attractive or repellent elements), and find that you can maintain your lucidity without conscious effort. Learning to do this can happen fairly rapidly. In my first year of studying lucid dreaming, I lost lucidity in 11 (18%) of 62 lucid dreams; in the second year, I lost lucidity in only 1 (0.9%) of 111 lucid dreams, and in the third year, only 1 (0.5%) out of 215 lucid dreams. [10] In the following 10 years, the rate of lucidity lost has stayed at less than one percent.

AWAKENING AT WILL

"My first lucid dream arose from my discovery as a child of 5 that I could wake myself from frightening dreams by trying to shout 'Mother!'" [11]

"I have found a paradoxical sounding, but simple technique for waking at will: 'Fall asleep to wake up.' Whenever I decide I want to awaken from a lucid dream, I simply lie down on the nearest dream bed, couch, or cloud, shut my dream eyes, and 'go to sleep.' The usual result is that I immediately wake up, but sometimes I only dream that I wake up, and when I realize I'm still dreaming, I try again to wake up 'for real', sometimes succeeding at once, but sometimes only after an amusing sequence of false awakenings.' [B.K., Palo Alto, California]

"When I was a little girl, about six years old, I came up with a method for awakening myself when dreams got too unpleasant. I don't recall how I came up with the idea, but I would blink my eyes hard three times. This worked well for a while, and got me out of some pretty horrific and surrealistic scenarios, but then something changed, and the method began to produce false awakenings. When I once used this technique to end a mildly distasteful dream, only to find myself awakening in my bedroom just before the arrival of a terrible hurricane, and certain that the experience was real, upon actually awakening I decided to abandon the practice." [L.L., Redwood City, California]

If the secret to preventing premature awakening is to maintain active participation in the dream, the secret to awakening at will is to withdraw your attention and participation from the dream. Think, daydream, or otherwise withdraw your attention from the dream, and you are very likely to awaken.

When five-year-old Alan Worsley called out for his mother in the physical world, he was directing his attention away from the dream as well as possibly activating the muscles of vocalization in his sleeping body, which could awaken him.

But nothing could provide a better illustration of the principle of waking by withdrawing attention from the dream than Beverly Kedzierski's formula "go to sleep to wake up." After all, what does sleep mean but withdrawal of attention from what is around us?

Another way of withdrawing your participation from the dream is to cease making the usual rapid eye movements so crucially characteristic of REM sleep. Tholey has experimented with fixation on a stationary point during lucid dreams. He found that gaze fixation caused the fixation point to blur, followed by dissolution of the entire dream scene, and an awakening within four to twelve seconds. He notes that experienced subjects can use the intermediate stage of scene dissolution "to form the dream environment to their own wishes." [12] Artist and dream researcher Fariba Bogzaran describes a very similar technique called "Intentional Focusing," in which she concentrates on an object in her lucid dream until she regains waking consciousness. [13]

However, the examples here show that using methods to awaken from dreams may lead to false awakenings. Sometimes, the false awakening can be more disturbing than the original dream you were trying to escape. In general, it is probably best not to try to avoid frightening dream images by escaping to the waking state. Chapter 10 explains why and how you can benefit from facing nightmares. An example of a good use for techniques of waking yourself at will from lucid dreams is for awakening while you still have the events and revelations of the dream clearly in mind.

TWO KINDS OF DREAM CONTROL

Before we go on to discuss ways in which you can exercise your will over the images of your dreams, consider the uses you can make of your new freedom.

When faced with challenging dream situations, there are two ways you can master them. One way involves magical manipulation of the dream: controlling "them" or "it," while the other way involves self-control. As it happens, the first kind of control doesn't always work--which may actually be a blessing in disguise. If we learned to solve our problems in our lucid dreams by magically changing things we don't like, we might mistakenly hope to do the same in our waking lives.

For example, I once had a lucid dream about a frightening ogre, whom I confronted by projecting feelings of love and acceptance, leading to a pleasurable, peaceful, and empowering resolution in my dream. Suppose I had chosen to turn my adversary into a toad, and get rid of him that way. How would that help me if I were to find myself in conflict with my boss or another authority figure whom I might see as an ogre, in spite of my being awake? Turning him into a toad would hardly be practical! However, a change in attitude might indeed resolve the situation.

A generally a more useful approach to take with unpleasant dream imagery is to control your self. Self-control means control over habitual reactions. For example, if you are afraid and run away, even though you know you should face your fear, you aren't controlling your behavior. Although the

events that appear to take place in dreams are illusory, our feelings in response to dream events are real. So when you're fearful in a dream and realize that it is a dream, you fear may not vanish automatically. You still have to deal with it; this is why lucid dreams are such good practice for our waking lives. We're free to control our responses to the dream, and whatever we learn in so doing will readily apply to our waking lives. In my "ogre dream," I gained a degree of self-mastery and confidence that has served me as well in the waking world as in the dream. As a result of such lucid dream encounters, I now feel confident that I can handle just about any situation. So if you'd like to enhance your sense of self-confidence, my advice is that you'd be wise to "control yourself, not the dream."

FLYING

"I read about your work and the techniques you suggested for having lucid dreams. I practiced noticing whether I was dreaming. The first night, after several non-lucid dreams, I suddenly remembered to ask myself tf I was dreaming. As soon as I answered "yes," something happened that your article did not mention. Everything in the dream became extremely vivid. The visual aspects were like someone turned up the contrast and the color. I saw everything in great detail. All my dream senses were amplified. I was suddenly intensely aware of temperature, air movement, odors, and sounds. I had a strong sense of being in control. Even though I had not planned to fly, something in the dream made me think about flying, and I simply leaped into the air (Superman style) and flew. The sensation was the most exhilarating and realistic dream experience I have ever had. I used to have flying dreams when I was younger, but they were more of the floating variety, and never higher than tree-top level. I never had the degree of control that I experienced in my lucid dream. I flew down a canyon of tall buildings, gradually gaining altitude. The buildings gave way to a park, where I embarked upon some aerial acrobatics. It was my last dream of the night, and the feeling of exhilaration lasted all day. I told everyone who would listen about the experiment and the success I had." [G.R., Westborough, Massachusetts]

"One night I was dreaming of standing on a hill, looking out over the tops of maples, alders, and other trees. The leaves of the maples were bright red and rustling in the wind. The grass at my feet was lush and vividly green. All the colors about me were more saturated than I have ever seen. Perhaps the awareness that the colors were 'brighter than they should be' shocked me into realizing that I was in a dream, and that what lay about me was not 'real.' I remember saying to myself, 'If this is a dream, I should be able to fly into the air.' I tested my hunch and was enormously pleased that I could effortlessly fly, and fly anywhere I wanted. I skimmed over the tops of the trees and sailed many miles over new territory. I flew upward, far above the landscape, and hovered in the air currents like an eagle. How the dream ended I don't recall, but when I awoke I felt as if the experience of flying had energized me. I felt a sense of well-being that seemed directly related to the experience of being lucid in the dream, of taking control of the flying." [J.B., Everett, Washington]

Flying dreams and lucid dreams are strongly related in several ways. First, if you ever find yourself flying without benefit of an airplane or other reasonable apparatus, you are looking at a fine dreamsign. Second, if you ever suspect that you are dreaming, trying to fly is often a good way to test your state. And if you want to visit the far corners of the globe or distant galaxies in your lucid dreams, flying makes an excellent mode of transportation.

If you think you are dreaming, push off the ground and see if you can float into the air. If you are indoors, after you fly around the room, look for a window. Go out the window, and strive for altitude. Curiously, more than a few dreamers (most likely city-dwellers) have reported that they

sometimes find an obstacle in the form of electrical power lines that seem to prevent their passage. And some of these oneironauts report a surge of energy, often accompanied by a burst of light, when they fly through the "power" lines. Beyond that barrier, oneironauts have flown around the earth, to other planets, distant stars and galaxies, and even mythical realms like Camelot or Shangri-la.

Flying is fun, and therefore worth doing for the sheer joy of it, even if you aren't determined to reach a specific destination. People seem to be able to fly in just about any manner imaginable, according to the hundreds of reports we have received. Many people fly "Superman style," with their arms extended in front of them. Also common is "swimming" through the air, probably because the closest experience we get to flying in the air, is "flying" in the water. Others sprout wings from their backs or their heels, flap their hands, or straddle jet-powered cereal boxes, or flying carpets, or supersonic easy chairs.

One way to challenge yourself and to begin to fly is to jump off tall buildings or cliffs. Uncontrolled falling is a common theme of nightmares, and the following anecdote suggests the potential usefulness of lucid dream flying as a means for overcoming this terror:

"My attempts at flying lucidly were the most interesting adventures I've had in lucid dreams. I have a great fear of heights, so falling in dreams, while not nightmarish, is common for me. I always wake up before I land. But attempting the exercise I read in your article, I flew over places which would have terrified me in a dream before--open water, snowy mountains. One night I was soaring in outer space and coming back to earth. No fear involved. But coming eventually to a small ledge in a mountain, I was afraid to land and almost woke up. Using your techniques (especially spinning), I forced myself to deliberately land on the very edge. I could see the mountains below, feel the cold, even smell the fresh air. It was really a great feeling to know I could not be hurt; because if I started to fall, I could just fly away again." [N.C., Fremont, California]

EXTENDING YOUR DREAM SENSES

"I gained conscious control in one of my dreams. I took a bicycle ride because I decided I'd like to broaden my sensual experience. As I pedalled, I called out the senses: Hearing! And I heard my own heavy breathing. Smell! And I smelled a whiff of cigarette smoke. I touched a big, rough-barked tree, heard the flapping of sparrow wings, saw much greenery, felt the wooden handles of the bicycle. My senses were so alive, just as good as if I were awake. Yet I knew I was dreaming. This excited me incredibly! I pedalled furiously to get back, to wake up, but I woke up feeling refreshed." [L.G., San Francisco, California]

Most people are astonished to discover that they are dreaming. The astonishment stems from the realization that they have been fooling themselves in a colossal way. It is definitely a surprise, especially the first time, to learn that your normally-trustworthy senses are reporting to you an absolutely flawless portrayal of a world that doesn't exist outside the dream. Indeed, one of the most common features of first lucid dreams is a feeling of hyper-reality that happens when you take a good look around you in the dream and see the wondrous, elaborate detail your mind can create.

First-time lucid dreamers often note a marked, pleasurable heightening of the senses, particularly the sense of vision. Hearing, smell, touch, taste can intensify instantly, as if you had found the volume control knob for your senses and turned it up a notch. Give it a try. Play with your senses, one at a time, as you explore the dream world. During daily life, we all have good reasons for tuning out

our senses so we can concentrate on getting our jobs done. In your dreams, however, you can learn how to turn them back on again.

Senses are marvelous instruments for providing continuous data about events inside and outside our bodies. Our brains structure this data into the models of the world we experience. We all have learned how to think, perceive, believe, and model the world in a certain way, and the greatest part of this learning took place when we were infants. The world-modeling process was automatic long before we were able to think about it. Therefore, it comes as a surprise when we discover in lucid dreams that the drama we perceive as real might only be a kind of stage set, and all the people in it but mental constructions. However, once we get used to the notion, it is natural and empowering to begin to take conscious control of our senses in the dream state.

THE DREAM TELEVISION

In the early 1980s, continuing his dual role as lucid dream explorer and researcher (like many in the field), Alan Worsley developed an interesting series of "television experiments." [14] In his lucid dreams he finds a television set, turns it on, watches it, and experiments with the controls to change such things as the sound level and the color intensity. Sometimes he pretends that the T.V. responds to voice control, so that he can ask it questions and request it to display various images.

Worsley reports that "... I have experimented with manipulating imagery, as if I were learning to operate by trial an internal computer video system (including 'scrolling,' 'panning,' changing the scene instantly, and 'zooming'). Further, I have experimented with isolating part of the imagery or 'parking' it, by surrounding it with a frame such as a picture frame or proscenium arch and backing away from it ('windowing')." [15]

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EXERCISE: THE DREAM TELEVISION

Before bed set your mind to remember this experiment. When you achieve lucidity, find or create a large, ultra-high resolution, total surround sound, television set. Make yourself comfortable. Turn it on. Find the volume, brightness, and color saturation controls, and slowly experiment with them. Turn the sound up an down. Tweak the color. When the picture is right, imagine the smell of your favorite food wafting right out of the picture tube. If you are hungry, allow it to materialize. Savor a sample. Conjure up velvet pillows and satin pajamas. Give all the senses a controlled workout. Observe what is happening in your mind as you adjust the color or contrast control on your world-modeling television monitor.

MANIPULATING LUCID DREAMS

"I dreamed of falling down the side of a building, and as I fell I knew I was still unprepared to face the fall, so I changed the building to a cliff. I grabbed onto foliage and shrubs that grew down the side and began climbing confidently down. In fact, when someone began falling from above me, I caught him and told him to think of footholds and plants to support him because 'it's only a dream and you can do what you want in it.' And I enjoyed a totally new excitement and headiness of purposely facing danger and risk. It was a deeply gratifying and proud moment in my life." [T.Z., Fresno, California]

"In this dream I was at my mother's house and heard voices in another room. When entering the room, I realized without a doubt I was dreaming. My first command was ordering the people in the room to have a more exciting conversation, since this was my dream. At that moment they changed their topic to my favorite hobby. I started commanding things to happen and they did. The more things began to happen, the more I would command. It was a very thrilling experience, one of the most thrilling lucid dreams I've had, probably because I was more in control and more sure of my actions." [R.B., Chicago, Illinois]

"Two weeks ago I had a dream of being pursued by a violent tornadic storm. I was on a cliff high above a beach and had been teaching others to fly, telling them that this was a dream and in a dream all you have to do to fly is believe you can. We were having a great time when the storm appeared, coming in from the ocean. Tornados and I go way back in dreams. They are some of my pet monsters of the mind. When this one appeared, it was announced by exceptionally strong winds and lightning and high waves. A young boy, a puppy, and I were together for some time running and seeking shelter, but then we stopped, poised on the very edge of the last great cliff before the open sea. Panic was bringing me close to the point of losing lucidity. But then I thought 'Wait! This is a dream. If you choose, you can keep running. Or you can destroy the tornado or transform it. The storm has no power to hurt the boy or the puppy. It is you it wants. Anyway, no more running. See what it is like from within.' As I thought this, it was as though some exceptional force lifted the three of us, almost blurring our forms as we were pulled toward the tornado. The boy and puppy simply faded out about midway. Inside the storm there was a beautiful translucent whiteness and a feeling of tremendous peace. At the same time it was a living energy that seemed to be waiting to be shaped and at the same time was capable of being infinitely shaped and reshaped, formed and transformed over again. It was something tremendously vital, tremendously alive." [M.H., Newport News, Virginia]

Taking action in dreams can mean many things--you can command the characters, or manipulate the scenery, as in the examples quoted above, or you can decide to explore part of the dream environment, act out a particular scene, reverse the dream scenario or change the plot. Although, as explained above, the greatest benefit from lucid dreams may come not from exercising control over the dreams, but from taking control of your own reactions to dream situations, experimenting with different kinds of dream control can extend your powers and appreciation of lucidity. Paul Tholey mentions several techniques for manipulation of lucid dreams: manipulation prior to sleep by means of intention and autosuggestion, manipulation by wishing, manipulation by inner state, manipulation by means of looking, manipulation by means of verbal utterances, manipulations with certain actions, and manipulation with assistance of other dream figures. [16]

Chapter 3 showed how intention and autosuggestion can influence lucid dreams. Manipulation by wishing is amply illustrated by oneironauts who have written of their ability to transport themselves and change the dream world simply by wishing it to happen. Manipulation by inner state is particularly interesting. Tholey says this about it, referring to his own research findings: "The environment of a dream is strongly conditioned by the inner state of the dreamer. If the dreamer courageously faced up to a threatening figure, its threatening nature in general gradually diminished and the figure itself often began to shrink. If the dreamer on the other hand allowed himself to be filled with fear, the threatening nature of the dream figure increased and the figure itself began to grow." [17]

Manipulation by means of looking plays an important part in Tholey's model of appropriate lucid dream activities. He cites his own research in support of the hypothesis that dream figures can be deprived of their threatening nature by looking them directly in the eye. Manipulation by means of verbal utterances is explained thus: "One can considerably influence the appearance and behavior of dream figures by addressing them in an appropriate manner. The simple question 'Who are you?' brought about a noticeable change in the dream figures so addressed. Figures of strangers have changed in this manner into familiar individuals. Evidently the inner readiness to learn something about oneself and one's situation by carrying on a conversation with a dream figure enables one to...achieve in this fashion the highest level of lucidity in the dream: lucidity as to what the dream symbolizes." [18]

Spinning, flying, and looking at the ground are two examples of manipulation by certain actions: these are actions that stabilize, enhance, or prolong lucidity. Other dream figures may be able to help you manipulate dreams to find answers, resolve difficulties or just enjoy yourself. Reconciling with threatening dream characters can help you to achieve better balance and self-integration. This application of lucid dreaming is a key topic in Chapter 11.

GETTING PLACES IN DREAMS

On a more basic level, to get the most out of lucidity, you need to know how to get around in the dream world. For many lucid dream applications, you may wish or need to find a particular place, person, or situation. One way to achieve this is by willing yourself to dream about your topic of choice. This is often called "dream incubation." It is a timeless procedure used throughout history in cultures that consider dreams valuable sources of wisdom. In ancient Greece, people would visit dream temples to sleep and find answers or cures.

Dream temples are probably not necessary for dream incubation--although they certainly would have helped sleepers to focus their minds on their purpose. This is the key: make sure you have your problem or wish firmly in mind before sleep. To do this, it is helpful to arrive at a simple, single phrase describing the topic of your intended dream. Since for the purposes in this book, you are trying to induce lucid dreams, you need to add to your focus the intention to become lucid in the dream. Then you put all of your mental energy into conceiving of yourself in a lucid dream about the topic. Your intention should be the last thing you think of before falling asleep. The following exercise leads you through this process.

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EXERCISE: LUCID DREAM INCUBATION

1. Formulate your intention

Before bed, come up with a single phrase or question encapsulating the topic you wish to dream about: "I want to visit San Francisco." Write the phrase down, and perhaps draw a picture illustrating the question. Memorize the phrase and the picture (if you have one). If you have a specific action you wish to carry out in your desired dream ("I want to tell my friend I love her."), be sure to carefully formulate it now. Beneath your target phrase, write another saying, "When I dream of [the phrase], I will remember that I am dreaming."

2. Go to bed
Without doing anything else, go immediately to bed and turn out the light.

3. Focus on your phrase and intention to become lucid
Recall your phrase or the image you drew. Visualize yourself dreaming about the topic and becoming lucid in the dream. If there is something you want to try in the dream, also visualize doing it once you are lucid. Meditate on the phrase and your intention to become lucid in a dream about it until you fall asleep. Don't let any other thoughts come between thinking about your topic and falling asleep. If your thoughts stray, just return to thinking about your phrase and becoming lucid.

4. Pursue your intention in the lucid dream
When in a lucid dream about your topic carry out your intention. Ask the question you wish to ask, seek ways to express yourself, try your new behavior, or explore your situation. Be sure to notice your feelings and be observant of all details of the dream.

5. When you have achieved your goal, remember to awaken and recall the dream
When you obtain a satisfying answer in the dream, use one of the methods suggested earlier in this chapter to awaken yourself. Immediately write down at least the part of the dream that includes your solution. Even if you don't think the lucid dream has answered your question, once it begins to fade, awaken yourself and write down the dream. You may find on reflection that your answer was hidden in the dream and you did not see it at the time.

CREATING NEW SETTINGS

"Dreams of this degree of lucidity also let me change the shapes of objects or change locations at will. It's lovely to watch the dream images sort of shift and run like colors melting in the sun until all you have all around you is shifting, moving, living color/energy/light--I'm not sure how to describe it--and then the new scene forms around you from this dream stuff, this protoplasmic modeling clay of the mind." [M.H., Newport News, Virginia]

Another way to dream of particular things is to seek them out or conjure them while you are in a lucid dream. In other literature about dreams you may find some objections to the notion of deliberately influencing the content of dreams. Some believe the dream state to be a kind of psychological "wilderness" that ought to be left untamed. However, as discussed in Chapter 5, dreams arise out of your own knowledge, biases and expectations, whether or not you are conscious of them. If you consciously alter the elements in your dream, this is not artificial; it is just the ordinary mechanism of dream production operating at a higher level of mental processing. Dreams can be sources of inspiration and self-knowledge, but you can also use them to consciously seek answers to problems and fulfill your waking desires.

Changing dream scenes at will can also help you to get acquainted with the full illusion-creating power at your disposal. Seeing that the world around you can switch from a Manhattan cocktail party to Martian canals at your command will be much more effective than the words in this book for teaching you that the dream world is a mental model of your own creation.

The increased sense of mastery over the dream gained by knowing that you can manipulate it if you wish will give you the confidence to fearlessly travel wherever the dream should take you. Your power here is precisely as large as you imagine it to be. You can change the color of your socks, request a replay of the sunset, or segue to another planet or the Garden of Eden, simply by wishing.

Here a few exercises you can experiment with in trying to direct your dreams. Not much is known about the best way to achieve scene changes in dreams, so take these exercises as hints and then work out your own method.

SPINNING A NEW DREAM SCENE

In my dream-spinning experiment, I wanted to go to the setting of a book I'm reading. I wanted to solve the mystery in the book. I reached my target. I started at the point the book began, met the characters in proper sequence, and when I went to the point in the book where I was with another character in the book who is a wizard, he took a running start, leaped off a mountain fortress wall, and turned into a hawk, thereby escaping his enemies, I also jumped off the wall and changed into a hawk. I dressed and spoke in the manner of the characters and took an active part in solving the mysteries in the book. [S.B., Salt Lake City, Utah]

Spinning during the course of a lucid dream may do more for you than merely prevent premature awakening. It may also help you visit any dream scene you like. Here's how to do it.

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EXERCISE: SPINNING A NEW DREAM SCENE

1. Select a target
Before going to sleep, decide on a person, time, and place you would like to "visit" in your lucid dream. The target person and place can be either real or imaginary, past, present, or future. For example, "Padmasambhava, Tibet, 850", or "Stephen LaBerge, Stanford, California, the present", or "my granddaughter at home, the year 2050."

2. Resolve to visit your target
Write down and memorize your target phrase, then vividly visualize yourself visiting your target, and firmly resolve to do so in a dream tonight.

3. Spin to your target in your lucid dream
It's possible that just by the intention you might find yourself in a non-lucid dream at your target. However, a more reliable way to reach your target is to become lucid first and then seek your goal. When you are in a lucid dream at the point where the imagery is beginning to fade and you feel you are about to wake up, then spin, repeating your target phrase until you find yourself in a vivid dream scene--hopefully your target person, time, and place.

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EXERCISE: STRIKE THE SET, CHANGE THE CHANNEL

Think of this as the opposite of the kind of magical transportation involved in spinning and flying. Instead of moving your dream-self to a new, exotic locale, simply change the environment of your dream to suit your fancy. Start with a small detail and work up to greater changes. Change the scene slowly, then abruptly, subtly, then blatantly. Think of everything you see as infinitely malleable "modeling clay for the mind." Some oneironauts have elaborated on Alan Worsley's example of the

dream television. When they want to change the scenery, they imagine that the dream is taking place on a huge, three-dimensional television screen, and they have the remote control in their hand.

DOING THE IMPOSSIBLE

"I dreamed that I was at a party recently and having a boring time when I stood back from the dream and knew it was a dream and then had a great time projecting myself into being whoever was having fun. At first I just tried being women, but then I said, it's a dream, why not be a man and see what that feels like? So I did." [B.S., Albuquerque, New Mexico]

In waking life we are used to restrictions. For almost everything we do, there are rules about how to act, how not to act, and what it is reasonable to try. One of the most commonly quoted delightful features of lucid dreaming is great, unparalleled freedom. When people realize they are dreaming, they suddenly feel completely unrestricted, often for the first time in their life. They can do *anything*.

In dreams you can experience sensations or live out fantasies that are not probable in the waking state. You can get intimately acquainted with a fantasy figure. But you could also become that figure. Dreamers are not limited to their accustomed bodies You can appreciate a beautiful garden. Or you can be a flower. Alan Worsley has experimented with bizarre things like splitting himself in half, and putting his hands through his head. [19] Many oneironauts pass through walls, breathe water, fly, and travel in outer space. Forget your normal criteria, seek for the kinds of things you can only do or be in dreams.

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Chapter 10: Overcoming Nightmares

What Are Nightmares?

I began to try to recognize my dreams as products of my mind, even as I dreamed them. The breakthrough came one night soon after a nightmare. I decided I could not live fully while I let my fears roam about on their own power, so to speak. I entered the dream state determined not to yield. I had read somewhere that a fear could only be dissipated by friendliness and trust. Anger, threats, aggressiveness were out. These reactions were actually fearful reactions. So I made up my mind to be friendly.

The dream evolved, and I barely had time to remind myself to smile before the nightmare began. This time it was an almost childish nightmare, in which my collective fears took the shape of a large, nebulous but very scary monster. I quailed and almost turned tail, but by sheer will (I was really scared) I stayed and let it approach. I said to myself "it's my dream, and if I forget this, I'll have to go through it again," and I smiled as sincerely as I could. What's more, I spoke as calmly as I could, a big step since waking or sleeping terror leaves me speechless. I said something like "I'm not afraid. I want to be friends. You're welcome to my dream!" and almost as soon as I said it, the monster became friendly, delightedly so. I was ecstatic. Needless to say, I awoke quickly, still saying "I did it!" (T.Z., Fresno, California)

I know that I can change a frightening situation in a lucid dream, so I don't let myself get scared or panic. I never run away from things or persons in my dreams anymore. And the strange thing is that in waking life I don't run away either, anymore. I face things head on and don't drag situations out forever. My lucid dreams have changed the way I look at life. People think I've changed through the years, but the fact is that this is the real me coming out. (V.F., Greensboro, North Carolina)

Nightmares are terrifying dreams; dreams in which our worst fears are brought to life in fully convincing detail. Whatever horrors you personally believe to be the worst things that could happen—these are the most likely subjects of your nightmares. All people, in every age and culture have suffered from these terrors of the night. People's understanding of the origins of nightmares has varied as much as their understanding of dreams. To some cultures, nightmares were the true experiences of the soul as it wandered another world as the body slept. To others, they were the result of the visitation of demons. Indeed, the word nightmare comes from the Anglo-Saxon mare, for goblin or incubus. (An incubus is a demon who comes in the night to steal the sexual favor of ladies, and has its female counterpart, the succubus.)

In Western culture today, most people are content to say of nightmares that they are "only dreams," meaning they are imaginary and of no consequence. Thus, when a successful business executive awakens with his heart pounding from a dream of being pursued by zombies through the jungle, he is grateful to be able to recite the comforting refrain, "Thank God, it was only a dream," get a glass of water and return to bed. However, when just a few minutes before the stinking corpses with eyes like pits to hell were breathing down his neck, the executive had no doubts about their reality. The zombies may have been imaginary, but the terror was real. So, to lightly dismiss the real terror of horrific dreams as illusory seems like an error that leaves us with no choice but to submit ourselves again and again to the greatest fear we are likely to ever experience.

What gives nightmares their special terror? In dreams, anything is possible. This limitlessness can be wonderful, since it allows us to experience delights of fantasy and pleasure unachievable in waking life. However, turn over the stone, and anything you can imagine that you would not like to experience, however unlikely in waking, can happen as well.

In nightmares we are alone. The terrifying worlds we create in our minds are populated with our fears. We may dream that we are accompanied by friends, but if we doubt them they can just as easily turn into fiends. If we run from an axe- wielding maniac, he can find us no matter where we hide. If we stab a devil with a knife, he may not even notice, or the knife may turn to rubber. Our thoughts betray us; if we think, I only hope he doesn't have a gun—lo! he has a gun. It is no wonder we are grateful to return from nightmares to the relative sanity and peace of the waking world.

Thus, it is understandable that people in the midst of nightmares who realize they must be dreaming frequently choose to wake up. However, if you become fully lucid in a nightmare, you realize that the nightmare can't really hurt you, and you don't need to "escape" it by awakening. You remember that you are already safe in bed. It is better, as we will discuss below, to face and overcome the terror while remaining in the dream.

Nightmare Causes and Cures

Studies of frequencies of nightmares among adults show that one third to one half of all adults experience occasional nightmares. A study of college students found that almost three-quarters of a group of 300 had nightmares at least once a month. In another study, five percent of college freshmen reported having nightmares at least once a week. [1] If this rate applies to the general population, then we might find that more than ten million Americans are plagued by wholly realistic horrifying experiences every week!

Some factors that seem to contribute to nightmare frequency are: illness (especially fever), stress (caused by situations like the difficulties of adolescence, moving, hard times at school or work), troubled relationships and traumatic events, like being mugged or experiencing a serious earthquake. Traumatic events can trigger a long lasting series of recurrent nightmares.

Some drugs and medications can cause an increase in nightmares. The reason for this is that many drugs suppress REM sleep, producing a later effect of REM-rebound. If you go to sleep drunk, you may sleep quite soundly, but dream little, until five or six hours into sleep. Then, the alcohol's effect has mostly worn off and your brain is prepared to make up for the lost REM time. As a result, you will dream more intensely than usual for the last few hours of your sleep time. The intensity is reflected in the emotionality of the dream, which often will be unpleasant.

There are a few drugs which seem to increase nightmares by increasing the activity of some part of the REM system. Among these are l-DOPA, used in the treatment of Parkinsonism, and beta-blockers, used by people with some heart conditions. Since research has shown that lucid dreams tend to occur during periods of intense REM activity, [2] I believe that drugs that cause nightmares may also facilitate lucid dreaming. This is a topic I plan to research in years to come. I think that whether an intense REM period leads to dreams that are pleasantly exciting or terrifying depends on the attitude of the dreamer.

Thus, it is to the dreamer's attitude that I think we should look in seeking a treatment for nightmares. For example, people rarely experience nightmares in the sleep laboratory, because they have a feeling of being observed and cared for. Likewise, children who awaken from nightmares and

crawl into bed with their parents feel safe from harm and thus are less likely to have more bad dreams.

I believe the best place to deal with unpleasant dreams is in their own context, in the dream world. We create our nightmares out of the raw material of our own fears. Fears are expectations—why would we fear something we thought would never happen? Expectations affect our waking lives, but even more so, they determine our dream lives. When in your waking life, you walk down a dark street, you fear that someone will threaten you. However, for some dark figure to actually leap out at you with a knife depends on there really being some knife-bearing thug hiding in an alley nearby waiting for a victim. On the contrary, if you dream of walking down a dark street, fearing attack, it is almost inevitable that you will be attacked, because you can readily imagine the desperate criminal waiting for you. But, if you had not thought that the situation was dangerous, there would be no thug, and no attack. Your only real enemy in dreams is your own fear.

Most of us harbor some useless fears. Fear of speaking in public is a common example. In most cases, no harm will result from giving a speech, but this fact does not prevent many people from being as frightened of public speaking as they would be if faced by a life threatening situation. Likewise, to be afraid in a dream, while understandable, is unnecessary. Even when fear is useless, it is still quite unpleasant, and can be debilitating. An obvious way to improve our lives is to rid ourselves of unnecessary fear. How is this done?

Research on behavior modification treatment for phobias shows that it is not enough for a person to know intellectually that the object of their fear is harmless. Snake phobics may "know" perfectly well that garter snakes are harmless, but they will still be afraid to pick one up. The way to learn to overcome fear is to face it—to approach the fearsome object or situation little by little. Each time you encounter the feared thing without harm you learn by experience that it cannot hurt you. This is the kind of approach we propose for overcoming nightmares. Many anecdotes demonstrate that the approach is effective, and can even be used by children.

None of our proposed treatments for nightmares require that you interpret the symbolism of the unpleasant images. Much fruitful work can be accomplished in dreams by working directly with the images. Waking analysis (or interpretation while in the dream) may help you understand the source of your anxieties, but will not necessarily help you outgrow them. For instance, consider again the fear of snakes. The classical interpretation of snake phobia is that it is a disguised anxiety about sex, especially regarding the male member, and in fact most snake phobics are women. A much more plausible biological explanation is that humans come into the world prepared to easily learn to fear snakes, because avoiding venomous snakes has obvious survival value. However, providing this information doesn't cure the phobia. What does help, as mentioned above, is for the phobic to slowly become accustomed to dealing with snakes. Likewise, dealing directly with dream fears, learning they cannot harm us, can help us to overcome them.

The Uses of Anxiety

According to Freud, nightmares were the result of masochistic wish-fulfillment. The basis of this curious notion was Freud's unshakable conviction that every dream represented the fulfillment of a wish. "I do not know why the dream should not be as varied as thought during the waking state..." [3] wrote Freud, tongue-in-cheek. For his own part, he continued, "I should have nothing against it... There is only a trifling obstacle in the way of this more convenient conception of the dream; it does not happen to reflect reality." If for Freud, every dream was nothing but the fulfillment of a

wish, the same thing must be true for nightmares: the victims of nightmares must secretly wish to be humiliated, tortured or persecuted.

I do not see every dream as necessarily the expression of a wish; nor do I view nightmares as masochistic wish fulfillment but rather as the result of maladaptive reactions. The anxiety experienced in nightmares can be seen as an indication of the failure of the dreamer to respond effectively to the dream situation.

Anxiety arises when we encounter a fear-provoking situation against which our habitual patterns of behavior are useless. People who experience anxiety dreams need a new approach for coping with the situations represented in their dreams. This may not be easy to find if the dream results from unresolved conflicts which the dreamer does not want to face in waking life. In severe cases, it may be difficult to treat the nightmare without treating the personality that gave rise to it. But I believe that this qualification applies mainly to chronically maladjusted personalities. [4] For relatively normal people whose nightmares are not the result of serious personality problems, lucid dreams can be extremely helpful. However, if you are to benefit from our method of overcoming nightmares, you must be willing to take responsibility for your experiences in general and in particular, for your dreams.

To illustrate how lucidity can help you work through anxiety- provoking situations, consider the following analogy. The non-lucid dreamer is like a small child who is terrified of the dark; the child really believes there are monsters there. The lucid dreamer would perhaps be like an older child—still afraid of the dark—yet no longer believing that there are really monsters out there; this child might be afraid, but would know that there was nothing to be afraid of, and could master the fear.

Anxiety is a state of uneasiness composed of two emotions: fear and uncertainty. It results from the simultaneous occurrence of two conditions: one is fear in regard to some (possibly ill-defined) situation we find threatening; the other is an uncertainty about how to avoid an unfavorable outcome. In other words, we experience anxiety when we are afraid of something, and have nothing in our behavioral repertoire that will help us overcome or evade it. Anxiety may serve a biological function: it prompts us to scan our situations more carefully and re-evaluate possible courses of action—in search of an overlooked solution to the situation- -in short, to become more conscious. [5]

When we experience anxiety in our dreams, the most adaptive response would be to become lucid and face the situation in a creative manner. In fact, anxiety does seem to spontaneously result in lucidity fairly frequently (for example, in a quarter of the 62 lucid dreams I had in the first year of my records). [6] It may even be the case that anxiety in dreams would always lead to lucidity if we were instructed about this possibility. With practice, dream anxiety can become a reliable dream-sign, no more dangerous than a scarecrow, pointing to where you need to do some repair work. There is no cause for fear in dreams....

Facing the Nightmare

In the midst of a lucid dream I saw a series of gray-black pipes. Out of the largest pipe emerged a black widow about the size of a cat. As I watched this black widow, it grew larger and larger. However, as it was growing I was not the least bit afraid and I thought to myself 'I am not afraid' and I made the black widow vanish. I was very proud of my achievement since I had always been terrified of black widows. The earliest nightmare I can remember was about a large black widow which I

couldn't escape. For me, black widows were a very strong symbol of fear itself. (J.W., Sacramento, California)

About twenty years ago I realized that the monster in my nightmares couldn't really hurt me. I told it I wasn't afraid any more and it changed into a toothless, whimpering witch and went away. Yesterday I read the article about your work in Parade magazine, and last night the monster returned. This time, knowing I was dreaming, I enjoyed the intricacy of detail, changing from one revolting, menacing shape to another, second by second. I remembered the black kitten you had described from one of your dreams and I told it to smile. I was stunned as I watched the bulging eyes recede, the snarling mouth try to relax into a smile. It didn't know how. The shark teeth changed into horse teeth and it beamed. It was the silliest damn thing I ever saw, and I woke up laughing my head off. I feel like a 67 year old kid with a new toy. (L.R., Jacksonville Beach, Florida)

"There is no cause for fear," wrote Sufi teacher Jalaludin Rumi seven centuries ago: "It is imagination, blocking you as a wooden bolt holds the door. Burn that bar...." [7] Fear of the unknown is worse than fear of the known, and this seems nowhere more true than in dreams. Thus, one of the most adaptive responses to an unpleasant dream situation is to face it, as can be seen in the following account of a series of nightmares experienced by the 19th Century lucid dream pioneer, the Marquis d'Hervey de Saint-Denys:

I wasn't aware I was dreaming, and I thought I was being pursued by frightful monsters. I was fleeing through an endless series of interconnecting rooms, always experiencing difficulty in opening the dividing doors and closing them behind me, only to hear them opened again by my hideous pursuers, who uttered terrible cries as they came after me. I felt they were gaining on me. I awoke with a start, bathed in sweat.

...I was all the more affected on waking because, when this particular dream came upon me, I always lacked, through some curious twist of fate, that consciousness of my state that I so often had during my dreams. One night, however, when the dream returned for the fourth time, at the moment my persecutors were about to renew their pursuit, a feeling of the truth of the situation was suddenly awakened in my mind; and the desire to combat these illusions gave me the strength to overcome my instinctive terror. Instead of fleeing, and by what must indeed under the circumstances have been an effort of will, I leaned against the wall and resolved to contemplate with the closest attention the phantoms that I had so far only glimpsed rather than seen. The initial shock was, I confess, strong enough; such is the difficulty that the mind has in defending itself against an illusion that it fears. I fixed my eyes on my principal attacker, who somewhat resembled the grinning, bristling demons which are sculpted in cathedral porticos, and as the desire to observe gained the upper hand over my emotions, I saw the following: the fantastic monster had arrived within several feet of me, whistling and cavorting in a manner which, once it had ceased to frighten me, appeared comic. I noted the claws on one of its paws, of which there were seven, very clearly outlined. The hairs of its eyebrows, a wound it appeared to have on its shoulder and innumerable other details combined in a picture of the greatest precision—one of the clearest visions I have had. Was it the memory of some Gothic bas-relief? In any case, my imagination added both movement and color. The attention I had concentrated on this figure had caused its companions to disappear as if by magic. The figure itself seemed to slow down in its movements, lose its clarity and take on a wooly appearance, until it changed into a kind of floating bundle of rags, similar to the faded costumes that serve as a sign to shops selling disguises at carnival time. Several insignificant images appeared in succession, and then I awoke. [8]

That seemed to be the end of the Marquis' nightmares. Tholey has also reported that when the dream ego looks courageously and openly at hostile dream figures, their appearance often becomes less threatening. [9] On the other hand, when one attempts to make a dream figure disappear, it may become more threatening, as in the following case of Sparrow's:

I am standing in the hallway outside my room. It is night and hence dark where I stand. Dad comes in the front door. I tell him that I am there so as not to frighten him or provoke an attack. I am afraid for no apparent reason.

I look outside through the door and see a dark figure which appears to be a large animal. I point at it in fear. The animal, which is a huge black panther, comes through the doorway. I reach out to it with both hands, extremely afraid. Placing my hands on its head, I say, "You're only a dream." But I am half pleading in my statement and cannot dispel my fear.

I pray for Jesus' presence and protection. But the fear is still with me as I awaken. [10]

Here the dreamer uses his lucidity to try to make his frightful image disappear. There is little difference between this and running from dream monsters. If, upon reflection, Sparrow had recognized that a dream panther could not hurt him, the thought alone should have dissipated his anxiety. Fear is your worst enemy in dreams; if you allow it to persist it will grow stronger and your self-confidence will diminish.

However, many novice lucid dreamers may at first tend to use their new powers to find more clever ways to escape their fears. This is because of our natural tendency to continue in our current frame of mind. If, in a dream in which you are fleeing from harm, you realize you are dreaming, you will still tend to continue escaping, even though you should now know that there is nothing to flee from. During the first six months of my personal record of lucid dreaming, I occasionally suffered from this sort of mental inertia until the following dream inspired a permanent change in my lucid dreaming behavior:

I was escaping down the side of a skyscraper, climbing like a lizard. It occurred to me that I could better escape by flying away, and as I did so, I realized that I was dreaming. By the time I reached the ground, the dream and my lucidity faded. The next thing I knew I was sitting in the audience of a lecture hall, privileged to be hearing Idries Shah (an eminent Sufi teacher) comment on my dream. "It was good that Stephen realized he was dreaming and could fly," Shah observed with a bemused tone, "but unfortunate that he didn't see that since it was a dream, there was no need to escape."

I would have had to be deaf not to get the message. After this dream lecture, I resolved to never use my lucidity to avoid unpleasant situations. But, I wasn't going to be content to passively avoid conflicts by doing nothing. I made a firm resolution regarding my lucid dreaming behavior: anytime I realized I was dreaming, I was required to ask myself the following two questions: 1) Am I now or have I been running away from anything in the dream? 2) Is there now or has there been any conflict in the dream? If the answer was yes to either, then I was honorbound to do everything I could to face whatever I was avoiding and to resolve any conflict. I have easily remembered this principle in almost every subsequent lucid dream and have attempted to resolve conflicts and face my fears whenever it was called for.

"Escaping" from a nightmare by awakening only suppresses your conscious awareness of the anxiety-provoking imagery. You may feel a certain relief, but like the prisoner who digs through his prison wall and finds himself in the cell next door, you haven't really escaped. Moreover, aware of it

or not, you are left with an unresolved conflict which will doubtless come back to haunt you some other night. In addition, you may have an unpleasant and unhealthy emotional state with which to start your day.

If, on the other hand, you choose to stay in the nightmare rather than waking from it, you can resolve the conflict in a way that brings you increased self-confidence and improved mental health. Then when you wake up you will feel that you have freed some extra energy with which to begin your day with new confidence.

Lucid dreaming gives us the power to banish the terror of nightmares and at the same time to strengthen our courage—if we master our fear sufficiently to recognize our most disturbing images as our own creations and face them.

Sleep Paralysis

My first experience of this terror of being awake but not in control of my body was when I was young, sick with a fever, and in my mother's bedroom. I saw a black shadow pass the window, enter the room and try to take the covers off of me. Inside I was screaming and frantic, outside I knew that nothing was happening. I was dreadfully scared of people coming in through that window, and this somehow helped me realize that it was a black shadowy figure, not a person. I fought it off and woke up. In the past year I have had a repeat of that dream complete with the feeling of flesh on my shoulder—I was terrified. Also recently, in another such dream, something awful was trying to kill me. I remembered something my husband had told me he'd done in the same situation when he was dreaming, so I turned and faced the "thing," and essentially challenged it to go ahead and kill me asserting that I was not afraid. I felt strongly that it could not hurt me if I put out my strength and began summoning up an image of goodness and purity (God) and praying. The "thing" was defeated and I woke up feeling very good. (K.S., Etobicoke, Ontario)

The experience of sleep paralysis can be terrifying, as in the example above. In a typical case, a person awakens, but then finds he cannot move. It may feel like a great weight is holding him down and making it difficult to breath. Hallucinations may appear, often loud buzzing noises, vibrations in the body, or people and threatening figures nearby. The dreamer may feel things touch his body, body distortions, or "electricity" running around inside him. As the experience progresses, the surroundings may begin to change, or the person may feel he is leaving his body—either by floating up or by sinking through the bed. Quite often, the dreamer knows the experience is a dream, but finds it very difficult to awaken.

The probable cause of sleep paralysis is that the mind awakens, but the body remains in the paralysis state of REM sleep. At first, the dreamer actually perceives the environment around him, but as the REM process takes over again, strange things begin to occur. Anxiety seems to be a natural concomitant of this physiological condition, and it is worsened by the dreamer's feeling that he is awake, his belief that these peculiar things are really happening, and the sensation of being unable to move. If the dreamer goes more completely into REM sleep, he loses the awareness of his body which causes him to feel paralyzed. At this point, he may experience the sensation of "leaving his body," as his mental body image is freed from the constraints of perceptual input from his actual body. [11]

Sleep paralysis experiences are likely to be the cause of some of the strangest night phenomena, such as visitations by demons, incubi, and succubi, and out-of-body experiences. They don't need to be terrifying, however, if you reflect as they are happening that they are dreams and that none of

the bizarre events are dangerous. People in these states commonly try to cry out for others to awaken them, or to force themselves to move in order to awaken. This usually only makes matters worse, however, since it increases their feelings of anxiety. Anxiety itself may help to perpetuate the condition. A better approach is to 1) remember it is a dream and therefore harmless, and 2) relax, and go with the experience. Adopt an attitude of intrepid curiosity. Dreams that proceed from paralysis experiences are often quite intense and wonderful.

Practicum for Overcoming Nightmares

I was on top of a mountain at the edge of a cliff. I seemed to be a prisoner of two guys who had a dog and a lion with them. I felt they were going to throw me off the cliff, so I rushed them and knocked the two guys off the cliff along with the lion but I went over too, into the water. I was alright and now my hands were free. I swam to the side and started to climb up the mountain but the lion was in front of me and he was angry because I pushed him into the water. He would not let me up so I tried to scare him by throwing water and rocks at him. He just got angrier. He started to get closer to me and I moved back into the water. He started to roar, and jumped in after me, but I jumped to the rocks. Now I was on my back and knew I couldn't get away, so I faced him, and as he attacked I said, "Come on." I put my hands out and suddenly I realized I was dreaming. In mid-attack his expression changed from rage to friendly and playful. When he landed on me I hugged him and we play wrestled and rolled. I kissed him and he licked me. I felt really great that I was lucid and playing with a lion. Then he rolled over and turned into a naked black woman. She was beautiful with large nipples on her breasts. I started to play with her, and was getting excited, but I had this feeling that getting back to the top of the cliff was more important, so I said, let's go back. As we started I woke up. (D.T., Lindenwold, New Jersey)

I had a fear of death, but cured it through a lucid dream. I was walking through a Hell-like environment and realized that this could not be, as I was asleep in my bed. At that instant, I was stabbed in the back. 'Feeling' the pain, I decided to see what 'dying' would be like. I felt myself in a catatonic state. I willed my dream 'soul' to depart from my dream 'body.' It was a strange feeling to see my dream 'body' beneath me. I also had a sense of all-pervading peace and calm. I said to myself that if this is what dying is like, it isn't so bad. From that day forward, I have had no fear of dying. I even remain calm in life-threatening situations. (K.D., Lauderhill, Florida)

Anyone who ever suffers from nightmares can benefit from using lucidity as a response to severe anxiety in dreams. Readers who have nightmares frequently will be able to put the advice we provide here to use right away. But others would do well to study these materials and have them ready in mind for the next time they find themselves in a frightening dream.

A few differing approaches to dealing with unpleasant dream experiences appear in the literature. They can all be assisted by lucidity, because when lucid we are sure of our context (dreaming) and know that waking world rules don't apply. One of the first proposed systems for overcoming nightmares was that attributed to the Senoi people of Malaysia by Kilton Stewart in his paper "Dream Theory in Malaya." [12] Patricia Garfield brought Stewart's ideas to the public in her inspiring book Creative Dreaming. [13] The basic principle of the Senoi system is to confront and conquer danger. This means that if you encounter an attacker or an uncooperative dream figure, you should aggressively attack and subdue it. If necessary, you are advised to destroy the figure, and thereby release a positive force. Once you have subdued the dream figure, you must force it to give you a valuable gift—something you can use in your waking life. Another suggestion is that you enlist friendly and cooperative dream characters to help you overcome the threatening character.

People have reported positive, empowering results with the "confront and conquer" approach. However, as Paul Tholey has found, attacking unfriendly characters may not be the most productive way to handle them. The reason for this will be discussed in detail in Chapter 11, but in brief, the idea is that hostile dream figures may represent aspects of our own personalities that we wish to disown. If we try to crush the symbolic appearances of these characteristics in dreams, we may be symbolically rejecting and attempting to destroy parts of ourselves.

Another idea associated with the Senoi is valuable to keep in mind regarding nightmares. Falling is a very common theme in anxiety dreams. The Senoi system proposes that when you dream of falling, you shouldn't wake yourself up, but go with it, relax and land gently. Think that you will land in a pleasant and interesting place, especially one that offers you a useful insight or experience. As a next step, it is suggested that in future dreams when you are falling, you should try to fly, and fly somewhere intriguing and worthwhile. In this way, you can turn a frightening, negative experience into one that is fun and useful.

Tholey, who has researched the efficacy of various attitudes towards hostile dream characters, concludes that a conciliatory approach is most likely to result in a positive experience for the dreamer. [14] His conciliatory method is based on the practice of engaging in dialogs with dream characters (see exercise below). He found that when dreamers tried to reconcile with hostile figures that the figures often transformed from "lower order into higher order creatures," meaning from beasts or mythological beings into humans, and that these transformations "often allowed the subjects to immediately understand the meaning of the dream." Furthermore, conciliatory behavior towards threatening figures would generally cause them to look and act in a more friendly manner. For example, Tholey himself dreamt:

I became lucid, while being chased by a tiger, and wanted to flee. I then pulled myself back together, stood my ground, and asked, "Who are you?" The tiger was taken aback but transformed into my father and answered, "I am your father and will now tell you what you are to do!" In contrast to my earlier dreams, I did not attempt to beat him but tried to get involved in a dialogue with him. I told him that he could not order me around. I rejected his threats and insults. On the other hand, I had to admit that some of my father's criticism was justified, and I decided to change my behavior accordingly. At that moment my father became friendly, and we shook hands. I asked him if he could help me, and he encouraged me to go my own way alone. My father then seemed to slip into my own body, and I remained alone in the dream. [15]

To have a good dream dialog, you should treat the dream figure as being your equal, as in the example. The following questions may open up fruitful lines of dialog with dream figures:

"Who are you?"

"Who am I?"

"Why are you here?"

"Why are you acting the way you are?"

"What do you have to tell me?"

"Why is such-and-such happening in this dream?"

"What do you think or feel about such and such?"

"What do you want from me? What do you want me to do?"

"What questions would you ask of me?"

"What do I most need to know?"

"Can you help me?"

"Can I help you?"

EXERCISE: DIALOGING WITH DREAM CHARACTERS

1. Practice imaginary dialogs in the waking state.
Choose a recent dream in which you had an unpleasant encounter with a dream figure. Get a piece of paper and pen to write down the conversation you imagine. Imagine yourself talking to the dream character; visualize the character before you. Begin a dialog by asking questions. You may choose a question from the list above or substitute any personally relevant question. Write down your questions, and the responses you get from the character. Try not to let critical thoughts interrupt the flow, such as "this is silly," or "I'm just making this up," or "That's not true." Listen, and interact. You can evaluate later. Terminate the dialog when it runs out of energy or when you achieve a useful resolution. Then evaluate the conversation and ask yourself what you did right and what you would do differently next time. Once you are successful with this, try the same exercise on another dream.

2. Set your intention.
Set a goal for yourself that the next time you have a disturbing encounter with a dream character you will become lucid and engage the character in dialog.

3. Dialog with problem dream figures.
When you encounter anyone with whom you feel conflict, ask yourself whether or not you are dreaming. If you find that you are dreaming, continue as follows: Stay and face the character, and begin a dialog with one of the opening questions from the list below. Listen to the character's responses, and try to address his, her, or its problems as well as your own. See if you can come to an agreement or make friends. Continue the dialog until you reach a comfortable resolution. Then, be sure to awaken while you still remember the conversation clearly, and write it down.

4. Evaluate the dialog.
Ask yourself if you achieved the best result you could. If you feel you did not, think about how you could improve your results next time. You could use Step 1 to relive the dialog to attain a more satisfying result.

(Adapted from Kaplan-Williams [16] and Tholey [17])

In contrast to the positive results of conciliatory dialog, Tholey found that when dreamers attacked dream characters either verbally or physically, the dream figures often regressed in form, for instance from a mother, to a witch, then to a beast. We might assume that the other characters in our dream worlds are more helpful as friendly humans than as subdued animals, so the aggressive approach may not be the best choice most of the time.

I say most of the time, because in some instances it may not be advisable to open yourself to a dream attacker. The circumstances which might make this true are in cases of dreams which replay real life events in which one was abused by someone—say, a rapist or child molester. In such cases, a more satisfying resolution may result from the Senoi approach of overcoming, destroying, and transforming the dream attacker. However, in many instances, Tholey's research has shown that aggressive attacks on dream characters can result in feelings of anxiety or guilt, and the subsequent emergence of dream "avengers." So, I would advise avoiding such behavior unless it truly seems to best option.

I have a few suggestions to add to these ideas for how to resolve nightmare situations. One is an extension of the "confront and conquer" approach. Though I cannot wholly recommend conquering dream characters, the intention to confront all danger in dreams is fully in accordance with my conception of a constructive dream-life. Remember that nothing can hurt you in dreams, and consider if there is any reason why you should not allow yourself to experience the things you are trying to avoid in the dream. An excellent example of enduring the dreamed danger is provided by Garfield:

I was in a subway like the London tube system. I came to an escalator. The first three or four steps weren't going. I figured I had to walk up. After I got up the first few steps, I found that it was working. I looked up toward the top and saw all this yellow machinery above the escalator. I realized that if I kept on going, I would be smashed by the machinery. I became frightened, and started to wake up. Then I said to myself, "No, I have to keep on going. I have to face it. Patty says I can't wake up." My heart began pounding and my palms sweating as I was carried nearer and nearer. I said, "This is bad for my heart," but I kept on going. Nothing happened. Somehow I passed it and everything was all right. [18]

In another case, a woman dreamt she had difficulty avoiding being struck by cars as she crossed a busy street. As she had an unusually intense fear of traffic in waking life, upon becoming lucid, she decided to directly confront her fear and leapt into the path of an oncoming pickup truck. She described that she felt the truck pass through her and then she, in an ethereal form, rose heavenwards, feeling elevated and amused.

This "let it happen" to you approach may not be best when dealing with dream characters, however. In Tholey's research, "Defenseless behavior almost always led to unpleasant experiences of fear or discouragement." [19] Hostile dream figures would tend to grow in size and strength relative to the dreamer. The reason for this may be that dream characters often are projections of ourselves, and by giving in to their attacks, we may be allowing untransformed negative energies within us to overpower our better aspects.

Chapter 11 discusses this idea in greater depth and proposes another method for placating hostile dream figures: You simply open your heart and accept them as part of yourself. This may not require any words at all, and can have an astonishingly positive effect.

Prescriptions for Nightmares

The following is a list of some of the more common nightmare themes, with suggested methods of transforming the dream to achieve a positive outcome. Make yourself a goal that whenever you next find yourself in a nightmare, you will become lucid, and overcome your fear. If the nightmare features one of the following themes, try the suggested responses.

1. Theme: Being pursued
Response: Stop running. Turn to face the pursuer. This is in itself may cause the pursuer to disappear or become harmless. If not, try starting a conciliatory dialog with the character or animal.

2. Theme: Being attacked
Response: Don't give in meekly to the attack or flee. Show your readiness to defend yourself and then try to engage the attacker in a conciliatory dialog. Alternatively, find acceptance and love in yourself and extend this towards the threatening figure (see Chapter 11).

3. Theme: Falling
Response: Relax and allow yourself to land. The "old wives' tale" is false—you will not really die if you hit the ground. Alternatively, you can transform falling into flying.

4. Theme: Paralysis
Response: When you feel trapped, stuck or paralyzed, relax. Don't allow anxiety to overcome your rationality. Tell yourself you are dreaming and the dream will soon end. Let yourself go along with any images that appear or things that happen to your body. None of it will hurt you. Adopt an attitude of interest and curiosity about what happens.

5. Theme: Being unprepared for an examination or speech
Response: First of all, you don't need to continue with this theme at all. You can leave the exam or lecture room. However, you might enhance your self-confidence in such situations by creatively answering the test questions or giving a spontaneous talk on whatever topic suits you. Be sure to enjoy yourself. When you wake up, you may want to ask yourself whether you should actually prepare for a similar situation.

6. Theme: Being naked in public
Response: Who cares in a dream? Have fun with the idea. Some find being naked in a lucid dream erotically exciting. If you wish, have everyone else in the dream remove their clothes. Remember, modesty is a public convention, and dreams are private experiences.

RECURRENT NIGHTMARES

After waking up from the nightmare, I would go back to sleep while thinking of a point in the dream before it went bad. I would go back to that point and re-dream the dream, changing it, recreating it so that it would turn out well and end up as a good dream. (J.G., Kirkland, Washington)

From a friend I received the advice that to just "stand there" in a dream could change its course. At that time I was having frequent terrifying dreams. I would wake up screaming for help—thus ending the dream. And, of course, the overtones of helpless fear carried over into the day. So before I went to sleep I began to say to myself that whatever happened in my dreams, I was simply going to stand there and meet the danger and just see what the dream would do about that.

An example of what happened is the elevator dream. I was stuck in an elevator. It wouldn't go up or down and I couldn't get out. Finally, I climbed out the top and while I was on the roof of the elevator, it began to go up very quickly and I would have been crushed against the top of the elevator shaft. Instead of screaming for help, I simply responded as an observer and recognizing that this was a dream, I said to the dream that I was going to sit there on the elevator. "Now, how will you handle that?" The elevator stopped short of the top. No harm was done. Not only that, the dream

was no longer out of control. Until that time the elevator dream had been recurring. It never returned. (V.W., Lincoln, Nebraska)

Since I was three years old, twice a month, I have had nightmares about tidal waves engulfing me; the details varied but the feeling was always the same: terror and helplessness. Until...in a half-awake state I determined to have a lucid dream about diving into a big wave. I did it! With my heart beating wildly, I ran toward the stormy sea, chanting that it's just a dream. I dove in headfirst. For a fearful moment I felt water in my lungs, but then began to enjoy the sensation of bobbing about in the powerful currents and waves ... after several (very pleasant) minutes of this, I washed up on shore.

I had one other lucid dream about facing the wave and enjoying being underwater. Since then, I have had no more nightmares of tidal waves. (L.G., San Francisco, California)

When thinking about a nightmare becomes so painful that we avoid it, it is not surprising that it recurs. However, even the most terrible images become less frightening when we examine them. I believe Saint-Denys sheds light on the mechanism of recurrent nightmares, in the following comment on his living gargoyle dream, quoted earlier in this chapter:

I don't know the origin of the dream. Probably some pathological cause brought it on the first time; but afterwards, when it was repeated on several occasions in the space of six weeks, it was clearly brought back solely by the impressions it had made on me and by my instinctive fear of seeing it again. If I happened, when dreaming, to find myself in a closed room, the memory of this horrible dream was immediately revived; I would glance towards the door, the thought of what I was afraid of seeing was enough to produce the sudden appearance of the same terrors, in the same form as before. [20]

I believe nightmares become recurrent by the following process: in the first place, the dreamer awakens from a nightmare in a state of intense anxiety and fear; naturally, he or she hopes that it will never happen again. The wish to avoid at all costs the events of the nightmare insures that they will be remembered. Later, something in the person's waking life associated with the original dream causes the person to dream about a situation similar to the original nightmare. The dreamer recognizes, perhaps unconsciously, the similarity, and thus expects the same thing to happen. Thus, expectation causes the dream to follow the first plot, and the more the dream recurs, the more likely it is to recur in the same form. Looking at recurrent nightmares in this way suggests a simple treatment: the dreamer can imagine a new conclusion for the dream to weaken the expectation that it has only one possible outcome.

Veteran dreamworker Strephon Kaplan-Williams describes a technique for re-dreaming the end of a nightmare; he calls it "dream re-entry." The technique can be practiced with any dream that you feel unsatisfied with the outcome of, but it seems especially apt for recurrent nightmares, in which you are stuck time after time with the same set of disturbing events.

Dream re-entry is practiced in the waking state. Dreamworkers begin by selecting dreams to relive, and then come up with alternative ways of acting in the dreams to influence the progression of the events towards more favorable or useful outcomes. Then they relive the dream in imagination, with the new action. They continue to visualize being in the dream until they see the result of their alternative behavior. Williams offers an example of dream re-entry from his own experience. He had dreamt: "I am in this house and there is something scary to confront. I don't want to do it and am all alone. I'm quite afraid. I wake up." He resolves to re-enter the dream and face the fear. In this

case, he actually fell asleep as he was practicing the re-entry process, which added to the intensity of his experience:

This time I make myself enter the bathroom where the source of my fears seems to be. I am so afraid, so afraid that the flow of images stops. But through sheer will I make myself enter the bathroom ready for anything. I think of taking my machete and thrashing around with it if I am attacked. But I decide against this because I want to confront my fear by willing myself to stay with the situation no matter what.... I am ready to face that which could overwhelm me and exist with it rather than try to defeat it.

...When I do [enter the bathroom], there seems to be a hulking luminescent figure there. It does not attack me but changes into a dwarf-like figure, long arms, roundish head, like Yoda. We face each other. I have stayed with the situation. No attack comes. My fear goes away when I experience what is there behind the door, and has been there so many years going back to childhood. What has been there behind every door and scary place is fear itself and my inability to fully deal with it. [21]

Several years ago, I used a similar approach with someone suffering from recurrent nightmares. A man telephoned me asking for help. He feared going to sleep, because he might have "that terrible dream" again. In his dream, he told me, he would find himself in a room in which the walls were closing in threatening to crush him. He would desperately try to open the door, which would always be locked.

I asked him to imagine he was back in the dream, knowing it was a dream. What else could he do? At first he was unable to think of anything else that could possibly happen, so I modeled what I was asking him to do. I imagined I was in the same dream and I visualized the walls closing in. However, the moment I found the door locked, it occurred to me to reach into my pocket where I found the key, with which I unlocked the door and walked out. I recounted my imaginal solution and asked him to try again. He imagined the dream again—this time he looked around the room and noticed that there was no ceiling and climbed out.

I suggested to him that if this dream should ever recur, he could recognize it as a dream, and remember his solution. I asked him to call me if the dream came back, but he never did. Unfortunately, we cannot be sure about what happened. But, I think that having found some way to cope with that particular (dream) situation, he had no need to dream about it again because he no longer feared it. As I have hypothesized elsewhere, we dream about what we expect to happen, both what we fear and what we hope for. I believe that the approach I have outlined can provide the basis for an effective treatment for recurrent nightmares, and look forward to it being tested clinically.

Some evidence has appeared in psychotherapy literature indicating that rehearsal (i.e., re-dreaming) can help people overcome recurrent nightmares. Geer and Silverman successfully treated an otherwise normal patient who suffered for fifteen years from a recurrent nightmare with five sessions of relaxation followed by seven sessions of mentally re-experiencing the nightmare (rehearsal). [22] The frequency of nightmares decreased only after the third rehearsal session, when the patient was instructed to say to himself "It's just a dream." After the sixth rehearsal session, several weeks later, the nightmare disappeared. Marks described a case in which a recurrent nightmare of fourteen years' duration disappeared after the patient relived the dream three times while awake and then wrote three accounts of the nightmare with triumphant endings. [23] Bishay treated seven cases of nightmares with simple rehearsal of the nightmare and/or rehearsal with an altered ending. [24] A

one-year follow-up of five patients in the latter study showed complete relief from nightmares in the four patients who successfully imagined masterful endings, and marked improvement in a patient who was only able to imagine a neutral outcome.

Rehearsal re-dreaming is done while awake. However, a similar technique can be practiced during the recurrent nightmare, if the dreamer is lucid. Instead of imagining how the dream might turn out if the dreamer tried something new, while lucid the dreamer can try the alternative action right there in the nightmare. The resultant resolution should be all the more empowering, because of the enhanced reality of the dream experience. Practicing altering the course of recurrent nightmares both in waking and dreaming may be even more effective. Sometimes, the waking re-dreaming exercise is enough to resolve the problem created in the dream so that it never recurs again. However, if the dream does occur again, then the dreamer should be prepared to become lucid and consciously face the problem. The exercise below incorporates both re-entry techniques.

EXERCISE: RE-DREAMING RECURRENT NIGHTMARES

1. Recall and record the recurrent nightmare.
If you have had a particular nightmare more than once, recall it in as much detail as you can, and write it down. Examine it for points where you could influence the turn of events by doing something differently.

2. Choose a re-entry point and new action.
Choose a specific part of the dream to change, and a specific new action that you would like to try at that point to alter the course of the dream. Also select the most relevant point before the trouble-spot at which to re-enter the dream. (If it is a long dream, you may wish to begin at the part that immediately precedes the unpleasant events).

3. Relax completely.
Find a time and place where you can be alone and uninterrupted for between ten and twenty minutes. In a comfortable position, close your eyes and relax as described in EXERCISE: PROGRESSIVE RELAXATION.

4. Re-dream the nightmare, seeking resolution.
Beginning at the entry point you chose in Step 2, imagine you are back in the dream. Visualize the dream happening as it did before until you reach the part at which you have chosen to try a new behavior. See yourself doing the new action, and then continue imagining the dream until you discover what effect your alteration has on its outcome.

5. Evaluate your re-dreamed resolution.
When the imagined dream has ended, open your eyes. Write down what happened as if it were a normal dream report. Note how you feel about the new dream resolution. If you are not satisfied, and still feel uncomfortable about the dream, try the exercise again with a new alternative action. Possibly, achieving a comfortable resolution with the waking exercise will be enough to stop the recurrence of the nightmare.

6. If the dream recurs, follow your re-dreamed plan of action.
If the dream occurs again, do in the dream what you visualized during waking re-entry. Remember that the dream cannot harm you and be firmly resolved to carry through with your new behavior.

Children's Nightmares

I learned as a child of five or six to control nightmares. For example, a dinosaur was chasing me, so I inserted a can of spinach into the plot, and upon eating it gained Popeye's strength and "vanquished" my foe. (V.B., Roanoke, Virginia)

I had this lucid dream when I was ten years old: Feeling like a frightened victim, I am high in a stone tower with my younger sister Diane. A witch has tied us up and is about to stuff us into gunny sacks and throw us out the window to drown in the water far below. My sister is crying and near hysteria. Suddenly my panic turns to lightness and wonder. I laugh. "Diane! This is only a dream! My dream! Let her throw us out the window because I can make us do anything we want!" The witch is now background material, no longer the imposing "control." We laugh as we fall through the air, gunny sacks melting away. The warm, friendly water gently supports us to the shore where we run, giggling, in the grass. For days after that dream I felt an inner strength, a sense that fear is now what I'd let it be up to that point. (B.H., Sebastapol, California)

As a child I participated in and controlled many of my own dreams. My own lucid dreaming started when I was about nine or ten years old. One night I had a dream in which I was being chased by an evil giant. In the dream I suddenly remembered my parents telling me there are no such things as monsters. It was then that I realized I must be dreaming. In the dream I stopped running, turned around and let the giant pick me up. The outcome of the dream was good and I awoke with a pleasant and confident feeling. Over the next two years I developed more skill at lucid dreaming, so much so that bedtime became exciting because of this new world I had discovered where anything was possible and I was the Boss. (R.M., Toronto, Canada)

Many people have reported discovering lucid dreaming as a means of coping with childhood nightmares, as in the cases above. Children tend to have more nightmares than adults, but fortunately, they appear to have little difficulty putting into practice the idea of facing their fears with lucid dreaming.

In her book Studies in Dreams published in 1921, Mary Arnold-Forster mentioned having helped children overcome nightmares with lucidity, [25] and I can relate a similar experience myself. Once, when I was making long-distance small-talk with my niece, I asked her about her dreams. Madeleina, then seven years old, burst out with the description of a fearful nightmare. She had dreamt that she had gone swimming, as she often did, in the local reservoir. But this time, she had been threatened and terrified by a shark. I sympathized with her fear and added, matter-of-factly, "but of course you know there aren't really any sharks in Colorado." She replied, "Of course not!" So, I continued: "Well, since you know there aren't really any sharks where you swim, if you ever see one there again, it would be because you were dreaming. And, of course, a dream shark can't really do you any harm. It is only frightening if you don't know that it's a dream. But once you know you're dreaming, you can do whatever you like—you could even make friends with the dream shark, if you wanted to! Why not give it a try?" Madeleina seemed intrigued. A week later, she telephoned to proudly announce, "Do you know what I did? I rode on the back of the shark!"

Whether or not this approach to children's nightmares always produces such impressive results we do not yet know, but it is certainly worth exploring. If you are a parent with children suffering from nightmares, you should first make sure that they know what a dream is and then tell them about lucid dreaming. For more information on children's nightmares and how to treat them, see Garfield's excellent book Your Child's Dreams [26]

That lucid dreaming promises to banish one of the terrors of childhood seems reason enough for all enlightened parents teaching the method to their children. In addition, an important bonus of the lucid dreaming approach to children's nightmares is that it results in an increased sense of mastery and self-confidence as can be seen in all of the examples above. Think of the value of discovering that fear has no more power than you let it have, and that you are the master.

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[LaBerge, S. (2000). Lucid dreaming: Evidence and methodology. Behavioral and Brain Sciences 23(6), 962-3. Commentary on target articles by J.A. Hobson et al. and by M. Solms in a special issue on dreaming. The printed version unfortunately differs from this html version in several respects, most importantly in the omission of all four figures included below.]

Lucid dreaming: Evidence that REM sleep can support unimpaired cognitive function and a methodology for studying the psychophysiology of dreaming

By Stephen LaBerge

ABSTRACT: Lucid dreaming provides a test case for theories of dreaming. For example, whether or not "loss of self-reflective awareness" is characteristic of dreaming, it is clearly not necessary to dreaming. Theories of dreaming that do not account for lucidity are incomplete, and theories that do not allow for lucidity are incorrect. The fact that lucid dreamers can remember to perform predetermined actions and signal to the laboratory allows them to mark the time of particular dream events accurately, allowing experiments to establish precise correlations between physiology and subjective reports, and enabling the methodical testing of hypotheses.

Just as dreaming provides a test case for theories of consciousness, lucid dreaming provides a test case for theories of dreaming. Although one is not usually explicitly aware that one is dreaming while in a dream, a remarkable exception sometimes occurs in which one possesses clear cognizance that one is dreaming. During such "lucid" dreams, one can reason clearly, remember the conditions of waking life, and act upon reflection or in accordance with plans decided upon before sleep. These cognitive functions, commonly associated only with waking consciousness, occur while one remains soundly asleep and vividly experiencing a dream world that is often nearly indistinguishable from the "real world" (LaBerge 1985). Theories of dreaming that do not account for lucidity are incomplete, and theories that do not allow for lucidity are incorrect.

Although lucid dreams have been reported since Aristotle, until recently many researchers doubted that the dreaming brain was capable of such a high degree of mental functioning and consciousness. Based on earlier studies showing that some of the eye movements of REM sleep corresponded to the reported direction of the dreamer's gaze (e.g., Roffwarg et al. 1962), we asked subjects to carry out distinctive patterns of voluntary eye movements when they realized they were dreaming. The prearranged eye movement signals appeared on the polygraph records during REM, proving that the subjects had indeed been lucid during uninterrupted REM sleep (LaBerge 1990; LaBerge et al. 1981). Figure 1 shows an example.

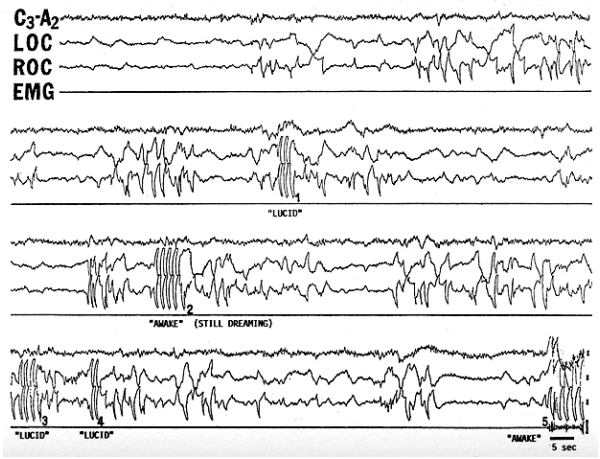

Figure 1. A typical signal-verified lucid dream. Four channels of physiological data (central EEG [C3-A2], left and right eye-movements [LOC and ROC], and chin muscle tone [EMG]) from the last 8 min of a 30 min REM period are shown. Upon awakening the subject reported having made five eye movement signals (labeled 1-5 in figure). The first signal (1, LRLR) marked the onset of lucidity. Skin potential potential artifacts can be observed in the EEG at this point. During the following 90 s the subject "flew about" exploring his dream world until he believed he had awakened, at which point he made the signal for awakening (2, LRLRLRLR). This signal, made in non-lucid REM shows that the precise correspondence between eye movements and gaze is not an artifact of lucidity. After another 90 s, the subject realized he was still dreaming and signaled (3) with three pairs of eye movements. Realizing that this was too many, he correctly signaled with two pairs (4). Finally, upon awakening 100 s later he signaled appropriately (5, LRLRLRLR). [Calibrations are 50 microV and 5 s.]

Our studies of the physiology of lucid dreaming fit within the psychophysiological paradigm of dream research that Hobson has helped establish. Therefore, I naturally agree with Hobson et al. in believing it worthwhile to attempt to relate phenomenological and physiological data across a range of states including waking, NREM, and REM sleep. I also share Hobson's view that REM sleep is unique in many ways; for example, stable lucid dreams appear to be nearly exclusively found in REM. As for the AIM model on which the Hobson et al. article focuses, I regard it as an improvement on the earlier Activation-Synthesis model. The AIM model makes many plausible and interesting connections, but still doesn't do justice to the full range and complexity of the varieties of dreaming consciousness accompanying REM sleep.

One of the problems with AIM is that its three "dimensions" are actually each multidimensional. For example, from which brain area is "Activation" (A) measured? Obviously, A varies as a function of brain location. Hobson et al. admit as much when they propose to locate lucid dreaming in a dissociated AIM space with PFC more activated than it usually is (see Hobson et al.'s Fig. 12). If this is true, then non-lucid dreaming would have to be characterized by a low value of A. Incidentally, there is no evidence to support the idea that lucid dreaming is in any sense a dissociated state (LaBerge 1990). Still, the need for multiple A dimensions seems inescapable.

Similarly, the "Information flow" (I) dimension is more complex than at first appears. Experimental evidence suggests that it is possible for one sense to remain awake, while others fall asleep (LaBerge 1990). A further problem with the I "dimension" is the confounding of sensory input and motor output, as can be seen in several of Hobson et al.'s examples (e.g., compare Figs. 15, 16B, 19).

Finally, "Mode of information processing" (M) attempts to reduce the vast neurochemical complexity of the brain to the global ratio of discharge rates of aminergic to cholinergic neurons. Is that really all there is to say about the neurochemical basis of consciousness? What about regional differences of function? What about the scores of other putative neurotransmitters and neuromodulators?

Perhaps due in part to the over-simplifications necessary to fit these multiple dimensions into an easy-to-visualize three, certain features of dreaming consciousness are misunderstood or exaggerated. For example, Hobson et al. say "self-reflection in dreams is generally found to be absent (Rechtschaffen 1978) or greatly reduced (Bradley et al. 1992) relative to waking." However the two studies cited suffered from weak design and extremely small sample sizes. Neither in fact actually compared frequencies of dreaming reflection to equivalent measures of waking reflection. A study that did make direct comparisons between dreaming and waking (LaBerge, Kahan, & Levitan 1995) found nearly identical frequencies of reflection in dreaming (81%) as in waking (79%), clearly con-

tradicting the characterization of dreams as non-reflective. Replications found similar results (Kahan & LaBerge 1996; Kahan, LaBerge, Levitan, & Zimbardo, 1997). These studies were cited in Hobson's article but otherwise ignored.

Another unsubstantiated claim of Hobson et al. is that "volitional control is greatly attenuated in dreams...." Of course, during non-lucid dreams people rarely attempt to control the course of the dream by magic. The same is true, one hopes, for waking. But likewise, during dreams and waking, one has similar control over one's body and is able to choose, for example to walk in one direction or in another. Such trivial choice is probably as ubiquitous in dreams as waking and, as measured by the question "At any time did you choose between alternative actions after consideration of the options?", 49% of dream samples had voluntary choice, compared to 74% of waking samples (LaBerge et al. 1995). The lower amount of choice in dreams may be an artifact of poorer recall or a real difference, but choice is by no means "greatly attenuated."

While making the above claim, Hobson et al. incorrectly attribute to me the false statement that "the dreamer can only gain lucidity with its concomitant control of dream events for a few seconds (LaBerge 1990)." [sic.] In fact, lucid dreams as verified in the laboratory by eye-movement signalling last up to 50 minutes in length, with the average being about 2 minutes (LaBerge 1990). The relatively low average is partially due to the fact that subjects were carrying out short experiments and wanted to awaken with full recall. At the onset of lucid dreams there is an increased tendency to awaken, probably due to the fact that lucid dreamers are thinking at that point, which withdraws attention from the dream, causing awakening (LaBerge 1985).

The eye-movement signalling methodology mentioned above forms the basis for a powerful approach to dream research: Lucid dreamers can remember pre-sleep instructions to carry out experiments marking the exact time of particular dream events with eye movement signals, allowing precise correlations between the dreamer's subjective reports and recorded physiology, and enabling the methodical testing of hypotheses. We have used this strategy in a series of studies demonstrating a higher degree of isomorphism between dreamed actions and physiological responses than had been found previously using less effective methodologies. For example, we found that time intervals estimated in lucid dreams are very close to actual clock time (see Fig. 2); that dreamed breathing corresponds to actual respiration (Fig. 3); that dreamed movements result in corresponding patterns of muscle twitching (Fig. 4); and that dreamed sexual activity is associated with physiological responses very similar to those that accompany actual sexual activity (see LaBerge 1985, 1990 for details).

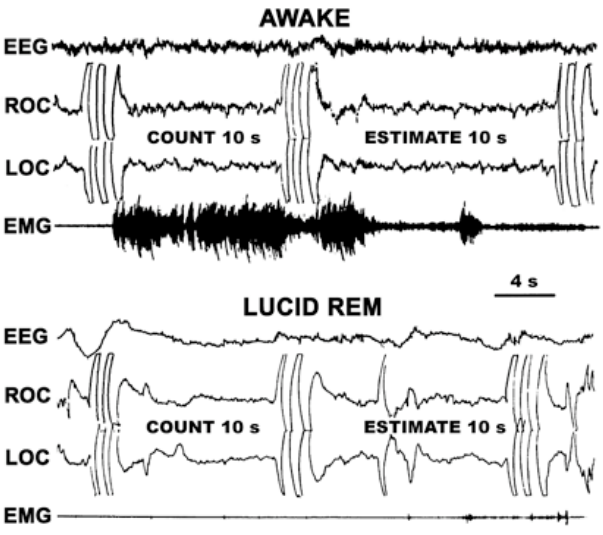

Figure 2. Dream time estimations. We have straightforwardly approached the problem of dream time by asking subjects to estimate ten second intervals (by counting, "one thousand and one, one thousand and two, etc.") during their lucid dreams. Signals marking the beginning and end of the subjective intervals allowed comparison with objective time. In all cases, time estimates during the lucid dreams were very close to the actual time between signals (LaBerge, 1980a, 1985).

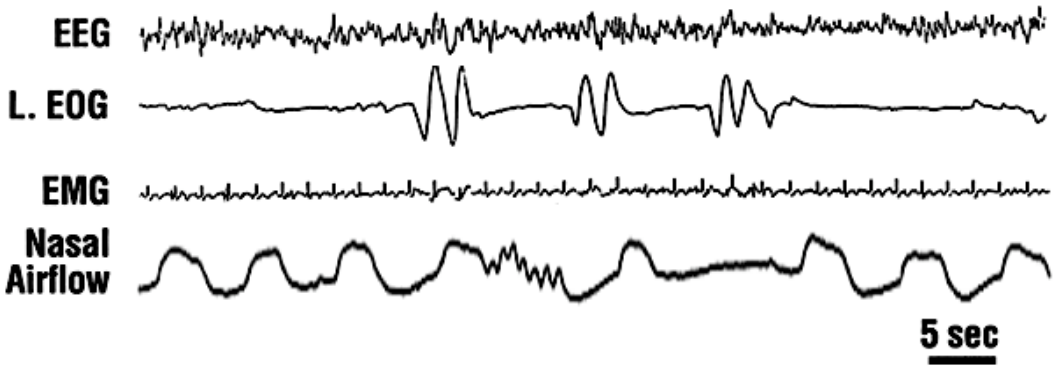

Figure 3. Voluntary control of respiration during lucid dreaming. LaBerge and Dement (1982) recorded three lucid dreamers who were asked to either breathe rapidly or to hold their breath (in their lucid dreams), marking the interval of altered respiration with eye movement signals as shown in the figure. The subjects reported successfully carrying out the agreed-upon tasks a total of nine times, and in every case, a judge was able to correctly predict on the basis of the polygraph recordings which of the two patterns had been executed (binomial test, $p < .002$).

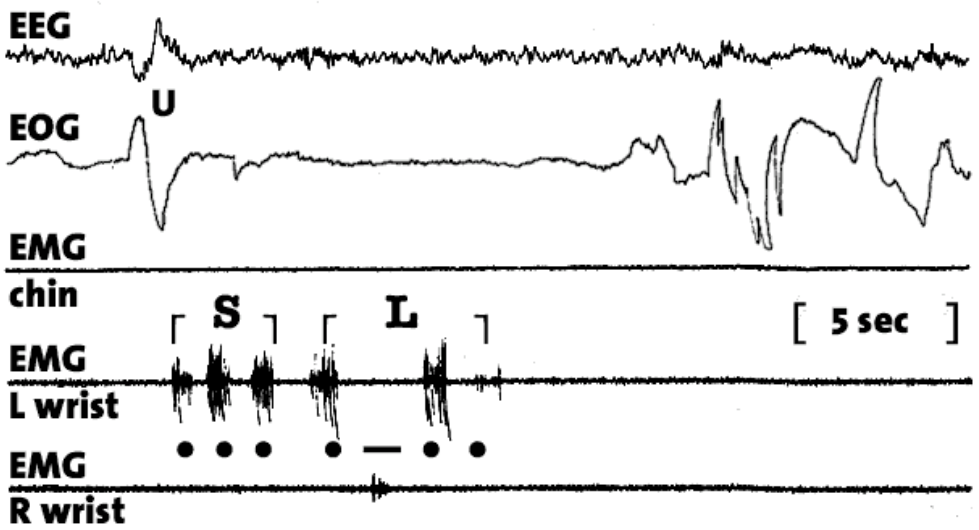

Figure 4. Morse code communication from the lucid dream. Evidence of voluntary control of other muscle groups during REM was found by LaBerge, Nagel, Dement, and Zarcone (1981) while testing a variety of lucidity signals. We observed that a sequence of left and right dream-fist clenches resulted in a corresponding sequence of left and right forearm twitches as measured by EMG. Here the subject sends a Morse code signal with left and right fist clenches corresponding to dots and dashes, respectively. Hence the message translates as "SL" (... .-..), the subject's initials. Note that the amplitude of the twitches bore an unreliable relationship to the subjective intensity of the dreamed action. Because all skeletal muscle groups except those that govern eye-movements and breathing are profoundly inhibited during REM sleep, it is to be

expected that most muscular responses to dreamed movements will be feeble. Nonetheless, these responses faithfully reflect the motor patterns of the original dream.

These and related studies show clearly that in REM sleep, dreamed bodily movements generate motor output equivalent at the supraspinal level to the patterns of neuronal activity that would be generated if the corresponding movements were actually executed. Most voluntary muscles are, of course, paralyzed during REM, with the notable exceptions of the ocular and respiratory muscles. Hence, the perfect correspondence between dreamed and actual movements for these two systems (Figs. 1-3), and the attenuated intensity (but preserved spatio-temporal pattern) of movements observed in Figure 4.

These results support the isomorphism hypothesis (Hobson et al.) but contradict Solms's (1995) notion of the "deflection" of motor output away from the usual pathways, and his speculation that it isn't only the musculo-skeletal system that is deactivated during dreams, but "the entire motor system, including its highest psychological components which control goal-directed thought and voluntary action." (Solms 1995, p. 58) I believe Occam's Razor favors the simpler hypothesis that the motor system is working in REM essentially as it is in waking, except for the spinal paralysis; just as the only essential difference between the constructive processes of consciousness in dreaming and waking is the degree of sensory input. See LaBerge (1998) for details.

Oddly, Hobson et al. ignore these data on eye movements while appealing that we keep open the question of relationship between eye movement and dream imagery "until methods more adequate to its investigation are developed." There is no need to wait. Adequate methods have already been developed, as shown above (Figs. 1-3), and in our recent study showing smooth tracking eye movements during dreaming (LaBerge & Zimbardo 2000).

Memory is another area of inquiry upon which lucid dreaming can shed light. Hobson et al. argue that memory during dreaming may be as deficient as it is upon awakening. They give the example of comparing one's memory of a night's dreaming to the memory of a corresponding interval of waking; unless it was a night of drinking being remembered, the dream will yield much less memory. But this is an example comparing episodic memory from waking and dreaming after awakening, and thus is not only unconvincing and vague, but irrelevant. Nobody disagrees that waking memory for dreams is sometimes extremely poor.

In the same vein, Hobson et al. write that it is common for dreams to have scene shifts of which the dreamer takes little note. "If such orientational translocations occurred in waking, memory would immediately note the discontinuity and seek an explanation for it." Note the unquestioned assumption regarding waking consciousness. In fact, recent studies suggest that people are less likely to detect environmental changes than commonly assumed (Mack & Rock 1998). For example, a significant number of normal adults watching a video failed to notice changes when the only actor in a scene transformed into another person across an instantaneous change in camera angle (Levin & Simons 1997).

Likewise, Hobson et al. assert that "there is also strong evidence of deficient memory for prior waking experience in subsequent sleep." However, the evidence offered is always extremely indirect and unconvincing. A direct test requires lucid dreamers to attempt memory tasks while dreaming, as was done in a pilot study (Levitan & LaBerge 1993) showing that about 95% of the subjects could remember in their lucid dreams a key word learned before bed, as well as the time they went to bed, and where they were sleeping. Subjects forgot to do the memory tasks in about

20% of their lucid dreams. That may or may not represent a relative deficit in memory for intentions.

A major methodological difficulty presented by dreaming is poor recall on awakening. The fact that recall for lucid dreams is more complete than for non-lucid dreams (LaBerge 1985) presents another argument in favor of using lucid dreamers as subjects. Not only can they carry out specific experiments in their dreams, but they are also more likely to be able to report them accurately. That our knowledge of the phenomenology of dreaming is severely limited by recall is not always sufficiently appreciated. For example, Hobson et al. repeatedly substitute "dreaming" for "dream recall" (e.g., Sect. 2.3.1). Solms (1997) makes the same mistake, which in my view, is fatal to his argument. So when he writes "of the 111 published cases ... in which focal cerebral lesions caused cessation or near cessation of dreaming...", he is really saying "in which lesions caused cessation of dreaming or dream recall." To think otherwise would be to suppose that the dream is the report.

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Varieties of Lucid Dreaming Experience

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I. Introduction

Realization that one is dreaming brings a wonderful sense of freedom–freedom to try anything in the extended range of experience. … The nature of lucid dream experience may range up to the mystical, whilst there seems to be an inherent resistance to anything erotic. (McCreery, 1973: 114)

When lucid dreams endure beyond a certain point, at least for me, orgasm is almost inevitable… in fully two-thirds of my lucid dreams, I feel the flow of sexual energy; this arousal culminates in an orgasmic burst on about half of these occasions. (Garfield, 1979: 134-35)

What can we conclude from the above quotations? Certainly nothing regarding the nature of eroticism in the lucid dream state. Rather, they illustrate that the experience of lucid dreaming is subject to individual variation. This should not be surprising, since lucid dreaming, like all forms of conscious experience, is comprised of a flow of subjective events created by brain processes using input from sensory-perceptual modalities, internal algorithms or schemata and, perhaps, poorly understood neuronal activity associated with central nervous system homeostatic maintenance. Variability in individual experience is inherent at all levels: anatomical in the form of limitations imposed by breath and sensory system development, physiological as sleep and REM sleep needs, inborn activation and damping tendencies, and psychological variation caused by recent and long-term experiences, the development of habits of interaction with the environment, and assumptions about the way the world works.

The range of subjective experiences reported to occur during dreaming appears wider and more variable than those typical of waking. In this chapter we will focus on the nature of experience in lucid dreams. We begin by showing that lucidity in dreams is not a discrete phenomenon, but that reflective consciousness exists in all dreams and can be measured on a continuum with "lucidity" and "non-lucidity" representing two ends of the spectrum. The remainder of the chapter will explore the substantial individual variation in lucid dreams, illustrated with examples derived from the authors' experiences. The discussion will focus on two primary themes: the role played by belief systems and learning in shaping lucid dream experiences, and the role played by factors which appear to be independent of the dreamer's beliefs and learning.

II. The Meaning of "Lucid Dreaming"

The distinction between nonlucid and lucid dreams represents perhaps the broadest level of variation in dream experiences presently recognized. The contemporary notion of a lucid dream is a

"dream in which one knows one is dreaming" (Green, 1968). This is in contrast to the nonlucid dream, in which dreamers are not aware of being in the dream state. Some dream theorists treat the lucid/nonlucid distinction in a way we consider too rigid, arguing these are two completely distinct types of phenomena (Hobson, 1988, 1994; Tart, 1984; Tholey, 1988). In our view, the distinction between lucid and nonlucid dreams is not as clear-cut as the definition suggests and fails to do justice to the subtlety of the actual experience. We feel the contemporary distinction has misplaced focus away from what we consider the essential variations in dream cognition underlying dream lucidity.

We have recently developed a psychological model that we believe captures the experiential essence of the differences between lucid and nonlucid dreams (DeGracia and LaBerge, 1998). In brief, our model hinges on the relationship of the waking self and the identity of the dreamer, and addresses the question: at what psychological levels do changes in self-awareness in the dream state occur that correspond to the onset of dream lucidity? Or stated somewhat differently, what exactly is dream lucidity?

Our basis for answering this question involved a systematic comparison of waking, lucid and nonlucid dreaming within the framework of the Global Workspace (GW) model of consciousness developed by Bernard Baars (1988). Recognizing that dreams in general are an expression of consciousness during sleep, the critical feature of Baars's GW model we used was his formulation that conscious processes are molded and framed by unconscious processes. Baars formulates unconscious processes as contexts. Contexts are operationally defined as "a system (or set of systems) that constrains conscious contents without itself being conscious" (Baars, 1988: 372). Accordingly, we compared the unconscious contextual structures underlying waking, nonlucid and lucid dream consciousness.

A. Waking

Baars' GW model provides a model of waking consciousness. The GW model posits that waking consciousness is framed by a nested hierarchy of unconscious elements which Baars terms a context hierarchy. The context hierarchy is a relatively stable global construct that transforms through time as a function of learning and experience. The context hierarchy of the waking personality is composed of many relatively distinct contexts which correspond to, or are a computational way to model, the sensory, perceptual, attentional, mnemonic, cognitive, metacognitive, goal and effector operations carried out unconsciously by the nervous system, but which in turn condition conscious experience. Contexts can be relatively more innate (such as the topographic organization of conscious perceptions) or relatively more learned (such as language and culture).

A context strongly dependent on learning can involve situation-dependent forms of cognition, in which the context remains latent until external circumstances dictate its full expression. An example of a situation-dependent context would be the knowledge and skills associated with piano playing. The full expression of a "piano playing context" is situationally dependent on the presence of an actual piano. When confronted with a piano, the "piano playing context" expresses itself as a nested hierarchy of effectors: the desire (or goal) to play triggers the necessary declarative knowledge (of notes and music, etc) which in turn triggers the necessary motor effectors (eye motions for reading music, hand motions for striking keys) resulting in the act of playing the piano. According to Baars, context formation initially requires conscious participation. But, once established, contexts are unconscious factors framing conscious experience. Many such contexts accumulate within the

waking personality as a function of learning and life experiences, and mold and frame the conscious aspects of waking.

B. Nonlucid Dreams

During nonlucid dreams, the consciousness of the dreamer is similarly constrained by unconscious contextual elements. These elements combine to form relatively transient global contexts that last only for a dream's duration, or possibly through a series of sequential dreams. The transience of global contextual structures in dreams contrasts to the relatively stable context hierarchy framing waking consciousness. One factor contributing to the transient quality of dream contexts involves the dreamer operating "in the moment" in response to the dream context with no conscious memory of precedents or antecedents to the events occurring in the dream. The unconscious global context framing nonlucid dream consciousness may or may not use elements from the waking context hierarchy. Typically, dream contextual elements related to explicit memories do not necessarily correlate to elements of the waking personality, while contexts related to non-explicit memories do. For example, the dreamer's sense of identity (a declarative context) may be significantly different from the waking sense of identity (LaBerge, 1985). Likewise, the conceptual situation of the nonlucid dream (e.g. the "dream plot") may have little to do with the episodic experiences of the waking personality. This "incongruency of contexts" between waking and nonlucid dreaming perhaps contributes to the view of some theorists that the nonlucid dream state is akin to madness (Hobson, 1994). However, contexts defining non-explicit behaviors, when expressed in nonlucid dreams, are closely similar to waking. Such non-explicit behaviors include, for example, conscious perceptual representation (DeGracia and LaBerge, 1998), speech production (Salzarulo and Cipolli, 1974), or metacognitive monitoring (Kahan and LaBerge, 1994).

The carry over of waking habits of metacognitive monitoring has a particular significance in nonlucid dreams. We typically do not metacognitively monitor our state of consciousness when awake. The general set of expectancies guiding our ordinary waking experience also governs our ordinary dream state. Since we tacitly assume, in both cases, that we are awake, our cognition during dreaming is distorted to fit the assumption that we are awake. When bizarre dream events occur, as they frequently do during REM sleep, they are simply assimilated into the contextual structure of the dream in a consistent fashion (DeGracia and LaBerge, 1998). Again, some theorists have used this assimilation by the dreamer of unusual dream events as evidence that dreaming cognition is akin to madness. From our view, however, we are simply observing the adoption of the waking self's habitual form of metacognitive monitoring by the dreamer.

Importantly, the contextual structures and conscious experiences of nonlucid dreams tend not to contribute episodic memories to the waking personality; a condition recognized as dream amnesia (Hobson, 1988). Although it is common to recall fragments of dreams upon awakening, it is likely that the great majority of our nightly dreams are not remembered at all (Diamond, 1963). For most individuals there is only a piecemeal conscious recollection of dream experiences. However, as stated above, the nonlucid dreamer can access both explicit and non-explicit memories of waking experience. Nonlucid dreaming therefore tends to be a one-way street with respect to memory transfer between states: from waking to dreaming, but not the reverse. The result of this relatively one-sided transfer of memories between states means that elements of the waking personality can contribute to the identity of the dreamer as building blocks in the global (albeit temporary) contextual structure of the dream. But, dreams rarely contribute to the consciously accessible memories of the waking personality.

Because of the transient nature of the global contexts in nonlucid dreams, we suggest nonlucid dreams may function, among other things, to recombine unconscious elements within consciousness on a temporary basis. We call this process "mental recombination" (cf. Hunt, 1989) by analogy with genetic recombination. From the viewpoint of biocomputation, mental recombination likely contributes to maintaining an optimal information processing flexibility in brain neuronal networks. This notion is practically identical with Greenberg and Pearlman's (1974) conclusion that the evolutionary development of the dream state "has made possible the increasingly flexible use of information in the mammalian family". The notion of dreaming as mental recombination is also consistent with the role of REM sleep in learning and assimilation of new knowledge (reviewed in LaBerge, 1985).

C. Lucid Dreams

Lucid dream consciousness, like waking and nonlucid dreams, is also framed by unconscious contextual elements. To understand the contextual structure of lucid dreams, we must look at the role played by consciously accessible memory across lucid dreams and waking. Lucid dreamers are able to freely recall details of waking life, to a greater or lesser extent, while within a lucid dream (LaBerge, 1985). Just as important, lucid dreams are remembered after awakening with a much higher frequency than nonlucid dreams, probably due to the presence of a mental set to remember in lucid dreams. Although it would be difficult to empirically ascertain, the anecdotal evidence suggests that at least some lucid dreamers remember their lucid dreams during waking at least as well as their waking experiences (LaBerge, 1985). In other words, lucid dreams contribute to the episodic memories of the waking personality. Therefore, in contrast to nonlucid dreams, there is a two-way transfer of consciously accessible memory between waking and lucid dream experiences. Thus, there is a relative continuity of consciously accessible memory linking lucid dreams and waking experience.

With repeated experiences of lucid dreaming, the associated memories of these experiences contribute to the formation of a stable and cumulative contextual structure in the mind of the waking self. This stable contextual structure we call the lucid dream context. The lucid dream context serves two complementary roles: (1) it serves as the global contextual structure framing lucid dream consciousness providing both precedent and antecedent structure to lucid dreams, and (2) it forms a situationally-dependent context within the waking personality. Regarding this latter point, lucid dreaming is a learnable skill (Moffitt, Hoffmann, et al, 1988; LaBerge, 1980, 1985; LaBerge & Rheingold, 1990). The full expression of this skill is dependent upon its occurrence during sleep, and is in this sense a form of situational cognition. The skill, however, belongs to the waking personality and shares features with other learned skills, particularly that it can be improved upon by learning and practice (LaBerge, 1980).

Thus, our distinction between lucid and nonlucid dreams is based on the contextual structure underlying dream consciousness: nonlucid dreams can be characterized by the formation of transient global contexts different from dream to dream, but lucid dreams are characterized by the presence of a distinct and persistent context, the lucid dream context. This lucid dream context belongs to both the waking personality and the lucid dreamer identity, serving as a bridge between them, and will continue to frame all future lucid dreams. The lucid dream context is susceptible to modification by learning and experience acquired in either the waking or lucid dream states.

There appear to be at least three essential components to the lucid dream context, each operating at a specific psychological level: (1) a "reference to state" operating as a metacognitive context, (2)

a semantic contextual framework operating at the level of declarative knowledge, expectation and belief, and (3) a goal-option framework operating at the level of effector action.

1. The Reference to State

When a lucid dreamer thinks "I am dreaming" there are at least two levels of cognitive activity at work in this thought: a direct experiential realization of, and self-reflection on, ones condition ("I am..."), and an interpretation of the nature of that condition ("…dreaming"). The former is a metacognitive act, the latter a semantic interpretation. The notion of "reference to state" indicates the metacognitive component of the lucid dream context. The reference of subjects to their state of being is not merely declarative knowledge, it is a direct apprehension of their immediate experience. Metacognition is not unique to lucid dreams but also occurs in nonlucid dreams (Kahan and LaBerge, 1994). However, in nonlucid dreams, "reflection during dreaming involves an awareness of conditions within the dream" (ibid., p. 250). That is to say, reflection on events in nonlucid dreams is confined to the contextual scope of the nonlucid dream (typically limited by the absence of the habit of metacognitively checking one's state). Metacognition during lucid dreams is not confined to events occurring in the dream, but references, either explicitly or implicitly, waking experience as well (DeGracia and LaBerge, 1998). The reference to state in a lucid dream is framed by access to memories of waking experience, allowing a contrast between one's current situation and the knowledge of waking life. This contrast provides the contextual structure for the metacognitive recognition that the current experience is not a normal waking experience. Hence, lucidity in the context of dreaming, implies metacognition framed by consciously accessible memories of waking experience.

2. The Semantic Framework

Individuals who experience lucid dreaming develop a framework of knowledge by which to conceptualize and give meaning to their experiences. These semantic frameworks affect the consciousness of lucid dreamers in a contextual fashion by providing assumptions, expectations and beliefs upon which the lucid dreamers interpret their experiences and acts. Because there is a large diversity of perceptual experience in lucid dreams (to be outlined below), an equally wide variety of semantic frameworks have developed to give meaning to these experiences. The knowledge framework used by a given individual does not require that the experiences be conceptualized by that individual as "a lucid dream". The semantic framework itself does not even have to be true. How lucid dreamers conceptualize their "non-waking experience" is a function of their general knowledge. Alternative modes of conceptualizing the lucid dream experience include the notions that one is undergoing an "out of body experience" (OBE) or an "astral projection" (reviewed in DeGracia, 1997). The forms taken by one's reference to state depend on one's semantic framework. So, the semantic component of the statement "I am dreaming" reflects a knowledge structure conceptualizing the experience as a form of dreaming. A reference to state can just as easily take the forms "I am having an OBE" or "I am having an astral projection". As one of us stated previously: "…lucid dreams and OBEs [and we will add here, astral projections] are necessarily distinguished by only one essential feature: how the person interprets the experience at the time" (LaBerge, 1985, p. 234) In other words, these are not phenomenologically distinct categories of experience but are alternative conceptualizations of the intrinsic variety present in lucid dream experiences.

Because dream experience is not constrained by sensory input or other limits of waking experience (such as the law of gravity, for example) beliefs and expectations play a key role in determin-

ing the form of and behavior occurring within a lucid dream. As we stated in the Introduction, we are interested in ascertaining which features of lucid dream variability are belief-dependent and which are not. By "belief-dependent" we are referring precisely to the role played by a semantic framework in conditioning an individual's lucid dream experiences. The semantic framework, because it is a declarative framework of knowledge, is susceptible to modification by learning and experience, and therefore is a crucial dynamic element in an individual's lucid dream context.

3. The Goal-Options Context

Lucid dreaming includes a set of intentional actions that, taken as a whole, we call a goal-options context. As the semantic framework is the declarative component of the lucid dream context, the goal-options context includes the procedural aspects of lucid dreaming related to effector actions. A lucid dreamer's goal-option context includes both lucid dream initiation techniques and the range of behaviors expressed in an individual's lucid dreams. Examples of characteristic goal-option behaviors include making voluntary choices in lucid dreams, making a habit of metacognitively checking one's state of consciousness, and making a habit of remembering lucid dream experiences. The goal-option context is also a dynamic element of the lucid dream context which undergoes refinement concomitant with the accumulation of direct experience in the lucid dream state. The semantic framework has a direct effect on the goal-options available to the lucid dreamer by limiting what the dreamer believes is and is not possible to do in the lucid dream state.

D. The Relationship Between Nonlucid and Lucid Dreams

Let us summarize the discussion thus far. Dream lucidity involves specific unconscious contextual structures operating at metacognitive, semantic and effector levels that frame the consciousness of the lucid dreamer: together these form a lucid dream context. A lucid dream context develops from a two-way, consciously accessible memory transfer between the lucid dreamer and waking self, represents learned skills, and is a stable facet of the waking personality which grows with experience. In contrast, nonlucid dreams are characterized by the transient formation of dream contexts which draw, to a variable extent, on elements of the waking personality, and do not contribute substantially to the consciously accessible memory structure of the waking personality.

Although this model appears to provide a clear-cut distinction between lucid and nonlucid dreams, it is not the main intention of this model to rigidly distinguish these experiences. We stated above our dissatisfaction with the current dichotomous notions of nonlucid and lucid dreams in this regard. This dissatisfaction derives from the inability of contemporary notions to adequately capture the lucid dreamer's experience, which can display subtle variations in cognition that are difficult to conceptualize. These variations seem to span the distinction between lucidity and non-lucidity as presented above so that our model is really intended to provide a basis for conceptualizing the subtle array of differences present in lucid dream experiences. Thus, the final step in our model is to develop how lucid and nonlucid forms of cognition can interact with one another.

To do so, we must turn again to notions introduced by Baars in the GW system. Baars defines the processes of cooperation and competition; these are mechanisms by which contexts interact. Cooperation refers to how contextual elements can form symbiotic linkages and mutually support each other in framing conscious processes. For example, the association of the metacognitive reference to state, semantic framework and goal-options context within the lucid dream context is an example of the cooperation of contextual elements. Competition is the opposite process whereby

contextual elements displace one another in their effects on conscious processes. A waking example of competition can be found in the Stroop test, where one reads colored words of the names of colors flashed briefly on a monitor. People tend to mistakenly say the color of the word, instead of reading the word itself. Here, unconscious color recognition processes compete with unconscious word recognition for control of the contents of consciousness.

We showed that cooperation and competition of contextual elements can be observed in both nonlucid and lucid dreams (DeGracia and LaBerge, 1998). We also showed that the tendency of nonlucid dreams to form transient global contexts is present during lucid dreams. Characters and situations encountered unintentionally in lucid dreams can serve as factors around which may nucleate a nonlucid dream context. These factors can compete with the lucid dream context for access to the dreamer's intentions. If the lucid dreamer does not make a conscious effort to maintain the lucid dream context, it is possible for these distractions to absorb the attention of the lucid dreamer and draw the dreamer into a situation that unfolds independent of the dreamer's volition. At the extreme, a newly generated dream context can displace the lucid dream context resulting in a loss of lucidity and the transformation of the lucid dream into a nonlucid dream. In practice, however, subtler forms of competition will allow the lucid dream context to co-exist with competing dream elements that are not contained in the lucid dream context, resulting in modifications of the cognition of the lucid dreamer which affect memory access, thinking and behavior. In such situations, the dreamer appears to phase in and out of lucidity to various degrees. Thus, because of competitive processes, the degree of lucidity can itself vary within a single lucid dream. These notions will form part of our basis for discussing variations in lucid dream cognition in following sections.

III. Variations in Lucid Dream Experiences

Having presented a way of looking at the distinction between lucid and nonlucid dreams, we will now turn our attention to outlining the degree of variety that exists in lucid dream experiences. Because lucid dream experiences tend to be remembered nearly as well as waking experiences, and because lucid dreams are cumulative experiences, lucid dream reports can provide highly detailed and descriptive accounts of lucid dream phenomenology. We will draw on such reports below to illustrate the range of variation in lucid dreams. Our survey of lucid dream variations will parallel the general temporal course of lucid dreams, discussing in turn, lucidity initiation, variations in perception, emotion, cognition and action within lucid dreams, and finally, the termination of lucid dreams.

A. Variations in Lucid Dream Initiation

Since the lucid dream context bridges the waking and dream states, logic suggests that lucid dreams could be initiated either from the nonlucid dream state (a dream-initiated lucid dream, or DILD) or from the waking state (a wake-initiated lucid dream, or WILD) (LaBerge, 1980). Because transitions directly from the waking state to the REM sleep state are very rare, one would expect WILDs to occur with a lower frequency than DILDs–just what the data shows.

1. Dream-Initiated Lucid Dreams

More than 80% of lucid dreams are initiated when a nonlucid dream transforms into a lucid dream (LaBerge, Nagel, Taylor, Dement, & Zarcone, 1981). This process involves the lucid dream context

displacing the current nonlucid dream context. The form of this displacement is dependent upon the individual's specific training in lucidity induction techniques and degree of lucid dreaming experience.

For inexperienced lucid dreamers, lucidity is perhaps most likely to arise from a nightmare or anxiety dream. LaBerge (1985) argues that there is an evolutionary-biological basis for anxiety stimulating reflective consciousness. Not all novice lucid dreamers experience anxiety-triggered lucidity; specifically, for example, DLD reports none, while SLB reports his percentage of anxiety-triggered lucid dreams recognized in years 1-3 respectively were 36%, 19%, and 5. The decrease in proportion (and frequency) of anxiety-initiated lucid dreams with time was probably due to the psychotherapeutic techniques SLB was practicing (LaBerge, 1985; see also Tholey, 1988) as the following example illustrates:

(SLB106) "I was in the middle of a riot in a classroom; a furious mob was raging about, throwing chairs and fighting with each other. A huge repulsive barbarian with a pock-marked face, the Goliath among them, had me locked in an iron grip from which I was futilely trying to free myself. At this point, I recognized that I was dreaming, and remembering what I had learned from handling similar situations previously, I immediately gave up my struggle … and tried to feel loving as I stood face to face with my ogre.

At first, I failed utterly, feeling only repulsion and disgust for the ogre. He was simply too ugly to love: thus spoke my visceral reactions. But I tried to ignore the image and seek love within my own heart. Finding it, I looked my ogre in the eyes, trusting my intuition to supply the right things to say. Beautiful words of acceptance flowed out of me, and as they did, he melted into me. As for the riot, it had vanished without a trace; the dream was over and I awoke, feeling wonderfully calm."

Other intense emotions such as embarrassment or delight can also initiate lucidity. Such lucid dreams are typically spontaneous and brief, and lucidity onset is quickly followed by awakening. Survey data suggest that most people have experienced a nominally lucid dream at least once in their lifetime (Snyder and Gackenbach, 1988). A spontaneously experienced lucid dream can serve as a nucleation event for the development of a lucid dream context, if there is follow-through on the part of the individual to cultivate these experiences.

A number of methods exist for the individual to intentionally cultivate the onset of lucidity from within nonlucid dreams (LaBerge, 1981, 1985; LaBerge and Rheingold, 1990; Rogo, 1983). The learning of these methods occurs during waking and adds to both the semantic and goal-option components of an individual's lucid dream context. The essence of methods to initiate lucidity during nonlucid dreams is to condition dreamers to recognize that they are dreaming through some form of state testing (also called "reality testing"). Some approaches to state testing are:

1. Anomaly recognition - Here dreamers condition themselves to use the recognition of bizarre dream events as a cue for lucidity onset. This approach is not limited to observing events in the dream but can be based on self-observation as well, so that, if they perceive their behavior as unusual (not typical of waking) this may induce lucidity.

(SLB351) "I'm walking through a field that is fantastically animated with extravagant life: Magic Mushrooms (Psilocybe cubensis) popping up everywhere and growing to gigantic proportions. I realize the fantasy element of this scene: I must be dreaming. I do two all up eye movement signals, but this causes the dream to begin to fade. I try to press the micro-switch, and I seem to have succeeded, but it feels like I'm already awake..."

The anomalies that serve as lucidity cues, or "dreamsigns" (LaBerge & Rheingold, 1989) can be very subtle indeed as the following account from von Moers-Messmer (1938) illustrates:

From the top of a rather low and unfamiliar hill, I look out across a wide plain towards the horizon. It crosses my mind that I have no idea what time of year it is. I check the sun's position. It appears almost straight above me with its usual brightness. This is surprising, as it occurs to me that it is now autumn, and the sun was much lower only a short time ago. I think it over: the sun is now perpendicular to the equator, so here it has to appear at an angle of approximately 45 degrees. So if my shadow does not correspond to my own height, I must be dreaming. I examine it: it is about 30 centimeters long. It takes considerable effort for me to believe this almost blindingly bright landscape and all of its features to be only an illusion. [Translation from LaBerge, 1985, pp. 38-39.]

2. Programmed behaviors - Here dreamers condition themselves to perform an act that will tend to produce distinguishable results when performed during either waking or dreaming. For example, attempting to fly in a dream will tend to lead to the experience of flying; if the individual actually "lifts off" then this is a strong indication that the experience is a dream (as in the following example). Another behavior that can result in lucidity initiation is attempting to read and reread text; if the text changes, then this is used as a lucidity cue. This approach can be simplified to the point of simply looking at one's hands as a cue for lucidity onset.

(SLB1032) "At a movie theatre, I am running down a flight of stairs, skipping more and more steps, until I notice that I seem to be able to skip as many as I like! Wait a minute! That makes this a dream. But it doesn't seem at all like it. So I step into the air to convince myself. It is indeed! As I float upward close to the wall, the scene begins to fade. I decide to test rubbing hands together instead of spinning. I vividly feel the sensation and then also the wall at my back. I keep rubbing for perhaps 15 seconds, and then I feel a closet door, which I open. At first the closet contains only vague images, but they finally become vivid. I am now in a bedroom. L is on the bed, "talking in her sleep." She says something unintelligible. I ask her to repeat it: She says "Wisdom is being given out …mumble, mumble." While wondering what she means, the dream fades and I awaken."

3. Déjà rêvé - Lucidity can sometimes be initiated when lucid dreamers have an apparent or actual recognition that they have had a similar dream before as in the following example:

(SLB31) "I am walking with my friend, M, when I recognize that we are in a place I have dreamed of before–'The Museum of Uninvented Inventions'–and that this therefore, is a dream. I reflect how the real M. would like to have lucid dreams, knowing quite explicitly that this is 'M', a dream figure. Nevertheless, I suggest to him that even though he is only a dream character, perhaps he could realize that he is dreaming. Maybe he does, for I wake up."

With increasing experience, DILD techniques become habitual. After a certain degree of experience, the individuals may simply recognize that they are dreaming without any apparent state testing or lucidity onset cue. Frequently dreamers question their state and decide they are awake and not dreaming. A dream in which the dreamer has at one point raised this question without arriving at the correct conclusion is commonly termed "pre-lucid" (Green, 1968). Pre-lucid dreams can be interpreted as a failed attempt by the lucid dream context to gain full access to framing dream consciousness.

2. Wake-Initiated Lucid Dreams

It is possible to maintain continuous reflective consciousness while falling asleep and hence to enter a lucid dream directly from the waking state. As with DILDs, this form of lucid dream initiation is a skill that improves with motivation and practice. Its cultivation has been described by Tibetan yogis, and several modern sources (LaBerge 1985; LaBerge and Rheingold 1990; Ouspensky, 1960; Rogo 1983). WILDs are most likely to occur after awakening in the morning or during afternoon naps (LaBerge, 1980). While falling asleep, the subject's mind is kept focused and lucid through the transition from waking to dreaming. Experiences of visual and auditory hypnagogic imagery are common during this transition. Unusual somesthetic imagery may also occur; subjects may feel themselves "float" or "sink out of their body". There may (e.g. SLB561) or may not (e.g. SLB37) be a momentary break in subjects' consciousness. Then the subjects will find themselves fully in a dream scene and lucid. Once in the dream-state, the lucid dream continues exactly like those initiated directly from the dream state. Some examples from the authors' personal experiences illustrate the fascination of this transition:

(DDG55) "I went back and laid on my bed hoping to project some more. I laid there and hypnagogic images came and went: city scenes, people sitting at a bar, a friend sitting on a stool behind an open door with a beautiful girl standing next to him. I could feel myself sinking deeper and deeper. Finally, I felt myself sink very deep and simultaneously my visual field locked into a stable scene and I felt a strong wind blowing over me. I could hear loud "whooshing" and wind sounds. Next I knew, the "wind" grabbed me and was pulling me along. It seemed to be pulling me forward but what I saw was me passing through fuzzy but identifiable frames of my bedroom."

(DDG48) "I woke from sleep. Had fleeting glimpses of my dream memories, then they were gone. I shut my eyes and could see hypnagogic images. A few scenes formed and faded but I don't recall what they were. The scene of a street formed vividly in front of my closed eyes. There was a river off to my left, 50-100 yards from the road. On the left seemed to be a construction site. There were buildings on my right. I was trying to observe details and I felt my foot step forward! This surprised me! Next thing I knew, I was walking along the street."

(SLB561) "I have just awakened from a dream in the sleep lab and am worrying about how the night is almost over and I still haven't succeeded in having a lucid dream. Suddenly, I find myself flying hundreds of feet above a field of wildflowers: I realize at once, with great excitement, that this is a dream and carry out the pre-planned protocol, making an eye-movement signal and singing 'Row, row, row your boat/ Gently down the stream/ Merrily, merrily, merrily/ Life is but a dream!' Then I make another signal and estimate 10 seconds by counting 'One thousand-one, ... one thousand-ten' and signal again. When I finish this sequence, I am overjoyed and do a virtual cartwheel in the air. After a few seconds, the dream begins to fade…."

(SLB37) "I was lying awake in bed late in the morning listening to the sound of running water in the adjoining bathroom. Presently, an image of the ocean appeared, dim at first like my usual waking imagery. But its vividness rapidly increased while, at the same time, the sound level of the running water decreased; the intensity of the internal image and external sound seemed to alter inversely (as if one changed a stereo balance control from one channel to the other). In a few seconds, I found myself at the seashore standing between my mother and a girl who seemed somehow familiar. I could no longer hear the sound of the bath water, but only the roar of the dream sea…."

Differences in styles of lucid dreaming give rise to individual differences in DILD and WILD frequency. Although quantification of such differences has not been attempted in a large sample of lu-

cid dreamers, to illustrate such stylistic differences, a comparison of lucid dream initiation frequencies of the authors is here presented. DDG has 114 recorded lucid dreams of which 43% were WILDs and 56% were DILDs. In contrast, only 8% of SLB's dissertation sample of 388 recorded lucid dreams were WILDs, a significantly lower proportion.

3. Ambiguities in Lucidity Induction

With increasing experience, some facets of lucid dreaming become habitual, making the classification of dream lucidity more ambiguous. Consider the following example:

(DDG74) "My (nonlucid) dream involved me, X and a bunch of other people. We were all roommates in a big house. I was unaware that I was dreaming. There was a party going on or something. We were down in the basement hanging out. However, at some point in the dream I looked at X and told him I'd be back in a little bit because I was going to go up to my room and try to project! I went up to my bedroom in this dream house. Again, at this point I thought everything was normal and had no idea I was dreaming. I laid down on my bed and started concentrating to leave just exactly like I always do on the physical plane….[text omitted of a 1400 word lucid dream report]

…I decided I was done for the time being, so I got up out of bed. I was still in the dream house and still unaware that I was dreaming. I went looking for some paper to record my experience. I ended up going back into the basement where everyone was still hanging out. X was there and the others and I told them all about the projection I had just had. Meanwhile, I'm getting very concerned that I can't find any paper. Then I woke up for real. For a moment I was totally disoriented."

In this example, DDG, in the midst of a nonlucid dream, performs his habitual techniques for achieving a WILD. He then experienced what was, for all practical purposes, a typical lucid dream. Following this, he "awakes" in the exact same nonlucid dream setting and seeks paper to record his lucid dream, which is also a habitual behavior. Shortly thereafter, DDG truly wakes up in a momentarily disoriented state.

How is one to classify such an experience? What we see here is a lucid dream nested perfectly inside of a nonlucid dream. One could argue that DDG merely dreamt that he was lucid dreaming, but this clarifies nothing. The characteristics of the lucid dream (the omitted text) were identical in general features to all of his other lucid dreams. What we believe this particular sequence represents is the cooperation between the global nonlucid dream context and DDG's lucid dream context. In this particular instance, the global nonlucid dream context provided perfectly for the full expression of the lucid dream context because the subject dreamt all of the requisite details needed for activation of his lucid dream context. After completion of the lucid dream, the lucid dream context returned control of access to the dreamer's consciousness to the previous nonlucid dream context. This kind of situation could only result because the subject possessed a well-defined lucid dream context that could clearly demarcate itself from the global nonlucid dream context.

This is an extreme example of the mixing of nonlucid and lucid dream elements. However, it is not uncharacteristic of the kind of subtleties and ambiguities encountered when attempting to characterize dream consciousness and what does and does not constitute dream lucidity. A related issue is the characterization of intentionality in lucidity induction. It is not always easy to draw a clear distinction between a lucid dream that is "spontaneous" and one that is "deliberately" induced. In fact, the characterization of such factors is critically dependent upon the subject's degree of experience, and the relative maturity of the lucid dream context. As the lucid dream context matures,

and hence, becomes more habitual, the likelihood of unintended lucid dreams increases and the ambiguity of what constitutes dream lucidity also increases. WILDs are typically intentional by nature. However, it is possible, for example, for an experienced lucid dreamer to lie down and nap with the intention to merely rest, and have an unintended WILD. In the case of DILDs, the issue of intention becomes even more ambiguous because the experienced subject may simply come to learn to recognize that he or she is dreaming, with no cause other than sheer familiarity with the state; in such a case, there may be no explicit onset of lucidity (e.g. no reality testing, no statement "I am dreaming").

Alternatively, experienced lucid dreamers may have a nonlucid dream in which they access elements of their lucid dream context incompletely and never achieve full lucidity. These types of considerations are important because they indicate that the subject's degree of experience can profoundly affect how dream lucidity manifests itself, and clearly indicate that lucidity induction is not homogeneous across subjects. What constitutes dream lucidity may be more subtle and ambiguous to identify for experienced subjects who have programmed aspects of lucidity induction and manifestation to be habitual.

B. Perceptual Variations in Lucid Dreams

The examples listed above begin to illustrate the diversity of perceptions that can occur in lucid dreams. By "perception" we are referring to the hallucinated sensory modalities characteristic of dream consciousness. Because afferent input from peripheral senses is attenuated during dreaming (LaBerge, 1985), it should be understood that the use of the term "perception" in the following discussion refers to the hallucinated analogs of the sensory modalities. Dreams are, in general, highly perceptual experiences expressing all the dream analogs of waking sensory modalities. Dream perceptions are typically characterized as "bizarre" (Hobson, 1988). Examples of perceptual bizarreness in dreams may include dream characters or environments transforming abruptly (discontinuities), or the perception of physically impossible scenes and events. Perceptual bizarreness occurs in lucid dreams just as it occurs in nonlucid dreams (Gackenbach, 1988). However, bizarreness in perception is often recognized as such by lucid dreamers, and can be described by them in vivid detail, providing us with a clear window into the perceptual qualities of lucid dreams.

To understand the perceptual diversity of lucid dreams we need to introduce the notion of perceptual environment. This is the complete hallucinated sensorium of the dreamer including all the sensory modalities: vision, audition, somatosensation, gustation, olfaction and the submodalities therein. These hallucinated sensory perceptions combine to form the dreamer's body image (if present), and the allocentric space perceived by the dreamer. The dreamer can be either immersed within the dream environment or observing it from without. For both authors, our lucid dreams are associated with immersion in the perceptual environment, which seems to hold true in general; reports of lucid dreamers as pure observers are rare (LaBerge, 1985). The vividness and richness of the perceptual environment ranges from the "minimal" in which most or all sensory qualities are absent or greatly attenuated, through the "typical" much like everyday experience, to the "surreal" in which the environment is vibrantly, psychedelically alive with fantastic, extravagant detail.

1. Typical Perceptual Environments

A "typical" perceptual environment is experienced as immersion within or observation of a rich sensory environment containing all sensory modalities. Typical perceptual environments are charac-

teristic of both nonlucid and lucid dreams. These environments generally contain the same elements that waking environments do such as landscapes, city streets, trees, buildings, driving in cars, etc., and are readily comprehensible by the dreamer, although bizarreness is frequent.

Within lucid dreams, typical perceptual environments display a large variety of perceptual qualities. In some the scene is dimly lit or vaguely delineated; others overwhelm the lucid dreamer with their intense beauty and extravagant detail. Some seem, indeed, "more real than real". In general, the average lucid dream is more perceptually vivid than the average nonlucid dream. This conclusion is supported by relatively intense brain activation during lucid dreaming which may correlate with increased perceptual vividness (LaBerge, 1981).

2. Surreal Perceptual Environments

A surreal perceptual environment is characterized by the presence of at least some sensory modalities displaying rich perceptual content. However, surreal environments have no counterpart in normal waking experience; they are often abstract spaces of color, shape, and motion within which the dreamer is immersed. These environments are abstract, and typically are not comprehendible by the dreamer. Surreal perceptual environments occur very rarely in nonlucid dreams (Hall and Van de Castle, 1966), although Hunt (1989) has discussed them in the context of activated dreams. A clear distinction should be drawn between surreal environments and bizarreness perceived in typical environments. Some forms of hypnagogic imagery and psychedelic drug-induced hallucinations (e.g. described in Mavromatis, 1987, and Aaronson and Osmond, 1970, respectively) resemble surreal perceptual environments, but in lucid dreams, there is a definite sense of somatic immersion in the environment. The following are examples of surreal perceptual environments; the lucid dreamer's lack of comprehension of his perceptions are apparent:

(DDG75) "But I managed to turn around and what I saw was unbelievable and utterly amazing. I don't even really know how to describe it! When, after great effort, I turned myself around, I was no longer seeing the forest. Instead I was looking onto this unbelievable colored field and there were three spheres ahead of me and they had something that looked like butterflies dancing in each of them. But they were not butterflies, though they looked a little like them. Whatever they were, there was one each inside of the three spheres and these "butterflies" were spinning and rotating within the sphere and constantly changing color. The way they changed color was strange, it was as if colors were welling into them from somewhere I could not see, like a liquid, and flowing around inside of these butterfly creatures. I was both awed and confused; confused that the forest was gone, and confused at what I was looking at, awed because whatever I was looking at was very, very beautiful."

(DDG70) "I got the idea to shut my eyes, spin around rapidly, and pretend that I was shrinking. When I did this and opened my eyes up I was quite surprised to see that I was actually somewhere else! And what I saw when I opened my eyes was amazing. I was in the midst of a spectacular panorama of swirling activity and spiraling colors. The scene was staggering in its complexity. I was floating amongst the images, floating surrounded by these moving color patterns. I remember that I was amazed, but baffled, and didn't understand in the least what I was looking at, other than that it was very beautiful and moving around too much to make out any definite structure."

What these surreal perceptions represent is currently unknown. It is intriguing, however, to speculate that lucid dreamers perceiving such imagery may be in fact perceiving the lower level neuro-

logical processes that underlie normal conscious sensory perceptions, as has been suggested for LSD-induced hallucinations (Mavromatis, 1983).

3. Minimal Perceptual Environments

Minimal perceptual environments are characterized by immersion in an environment containing a minimum of sensory perception. Again, these appear to occur frequently in lucid dreams, but rarely in nonlucid dreams. This is a relatively neglected area in the literature with the exception of Gillespie (1988), who has experimented extensively with deliberately eliminating sensory content from his lucid dreams.

It is not uncommon for lucid dreamers to involuntarily "fade" from a lucid dream to the waking state with no break in consciousness (LaBerge, DeGracia, et al., 1998). Prior to and during the fading process, lucid dreamers perceive their sensorium as "unstable". In general, lucid dreamers learn to perceive their sensorium as more or less stable; this is a perception with no counterpart during waking. When a lucid dream is "stable", all perceptions of the dream environment appear normal. When a lucid dream is "unstable", there may be a "blinking on and off" of the visual field, as if one is phasing in and out of blindness. The visual field may also become cartoon-like or pale in color. Somatic sensations may feel as if they are fading in and out. Although the basis of this fading process is not currently understood, techniques exist to stabilize one's sensorium in the event that it is perceived to be fading (LaBerge, DeGracia, et al., 1998). The degree to which lucid dreamers experience instability events seems to be quite variable both between and within subjects. We know of no waking counterparts for the perception and sensations associated with fading and stability. These are wholly experienced and learned in the lucid dream state. Even in nonlucid dreams the experience of fading appears confined to the transition to waking. However, in lucid dreams, variations in one's "stability" can occur at any time during a lucid dream, for a greater or lesser duration.

Minimal perceptual environments are related to perceptions of fading and stability. Some individual lucid dreamers do not awaken when they experience a complete loss of stability and fade from their lucid dreams. Instead they find themselves in minimal perceptual environments. Minimal perceptual environments are characterized by a loss of the rich sensory modalities typical of dreaming; such experiences may be perceived by the lucid dreamer as being in a "void" or in "darkness". However, lucidity is preserved; internal speech, affect and cognitive function remain intact within this minimal environment. Some sensory modalities are also preserved; kinesthetic sensations may be present (so that the subject seems to be "moving") although somesthetic sensations (sense of body image) typically are absent. There are perceptions of visual depth (e.g. the "darkness" has a sense of depth and size to it), but typically not visual perceptions of color or form. The "darkness" can sometimes appear to have visual motion; it may "swirl" or "bellow".

Because some lucid dreamers can undergo a loss of stability and appear in a minimal perceptual environment instead of awakening, it is possible for a lucid dream experience to consist of a string of lucid dreams occurring in typical or surreal environments punctuated by minimal environments (a multi-part lucid dream). That is, the lucid dreamer will be in a typical lucid dream, lose stability and fade from the dream into a minimal environment. Techniques similar to those used to prevent lucid dream fading, such as spinning in place or inducing somatic sensations, can also be used to cause a sensorium to re-form around the lucid dreamer, giving rise to the second lucid dream. The second lucid dream environment may or may not be the same as the first. The cycle can then re-

peat. It is possible for a single lucid dream session to consist of perhaps six or more lucid dreams in typical or surreal environments punctuated by fadings or minimal experiences.

The following are accounts of minimal sensory environments from the authors' records.

(DDG16) "Found myself in the void. My mind was wandering in all kinds of thoughts. Then I noticed that I could 'leave' my body. I flew off through the void. Everything was dark, kind of somber, and I didn't have a body. I had the desire to be somewhere. Soon a large, what appeared to be wooden fort appeared in the mist. It was still quite dark but I could 'see' now."

(DDG31b) "Though I was in the void, I was still being pulled along by this mysterious wind force. As I was being pulled along, a very beautiful rainbow colored sphere came rolling past me and it was very clear and well defined in appearance. I was very surprised because this is the first time I had ever actually seen an object in the void and I began to wonder what was going on. I quickly noticed that I was surrounded by subtle arrays of colored patterns. It was very subtle because the darkness of the void seemed to be covering over these color patterns, the patterns seemed to be behind the darkness. The colors and patterns were very intricate and I have no words to describe what I was seeing."

(DDG61) "In my imagination, I imagined flying off, but got pulled back again. This happened twice. Then, I dove off my bed straight downwards. I was moving straight downwards in the void. Far below me in the darkness I saw a square floating. In the square I could see colors, like a scene was inside the square. I stretched to grab this square and my arms stretched far below me like Plastic Man, and I grabbed the floating square. I pulled it up over me like putting on a pair of pants, and was thinking to myself, 'I'm not gonna let this one go!' I stepped into this square and was all of a sudden somewhere! I was very surprised. I was in what looked like a high school hallway standing in line with people going into a room."

(SLB56) "...I am looking at the image of an instruction book for a vacuum cleaner or some such appliance, knowing that I am asleep. As I focus on the writing the image stabilizes (and I have a sensation of opening my eyes) and I am able to read some but it is not interesting to me. Then my hands appear and I am looking at this piece of paper in bed. I think I ought to do the eye movements and so I follow my finger up, then down (I am very aware of the muscle strain in my arm and wrist, and feel the need to urinate). Then the dream fades."

It is of interest to note that the lucid dreamer can "fade out" from both typical and surreal environments into minimal environments, and conversely, can "materialize" out of a minimal environment into typical or surreal environments (as DDG61). As (DDG31b) indicates, the dreamer perceived "the darkness of the void seemed to be covering over these color patterns, the patterns seemed to be behind the darkness". It is almost as if the lucid dreamer's sensorium is tuning in and out of stable patterns of perceptions, akin to tuning a radio to a radio station. The following journal entry illustrates clearly how surreal and minimal environments can fuse, and fade into typical environments. This example suggests that clues to understanding sensory consciousness may be found in the phenomenology of lucid dream perceptions:

(DDG64) "I seemed to now be floating in the void. However, there were what seemed to be colored triangles moving around, crossing and spinning over one another making distinctly geometric patterns in front of me. The colors were mainly a yellowish green with red, orange and pink hues and they had the texture of clear and smoky, but smooth glass. 'This is a weird view of the void,' I thought to myself. I stared at these patterns wondering what the hell I was looking at. I began to focus harder and harder on these patterns, trying to discern some detail in them. Then, as I was

focusing, the most incredible thing happened. I watched these patterns 'solidify' and transform into the scene on the dance floor of the club I had just faded from. The spinning triangles were actually the dancing people in the club! I was amazed. I relaxed my focus and the scene faded back to the spinning triangles. I was thinking, 'Wow! This is amazing!' I tightened my focus again and the triangles again transformed into the dancers on the dance floor. This time I tightened my focus so much that the entire bar scene faded in around me! I was back in the bar again!"

What minimal lucid dream environments correspond to in physiological terms is unknown. It is tempting to speculate that minimal, surreal and typical perceptual environments correspond with lesser to greater degrees of brain activation, respectively, during REM sleep. Minimal environments superficially resemble the "thought-like" character of non-REM subjective experience (Hobson, 1988). However, given the fact that it is more or less easy to re-establish a typical or surreal environment from a minimal environment, the minimal environment may correlate with tonic REM. The time after REM onset may also be an important variable affecting perceptual qualities of lucid dreams. The interrelated phenomena of stability, fading, and minimal perceptual environments during lucid dreams has interesting implications for our understanding of conscious processes. Clearly, in these experiences, higher level cognitive functions of consciousness continue to operate in the relative absence of conscious sensory modalities. We are observing in these phenomena some type of dissociation, or perhaps lack of binding, of the contents of consciousness. Psychophysiological characterization of this phenomena would be of great interest.

No previous studies have presented data regarding the frequency with which lucid dreamers as a population or individual lucid dreamers experience the three perceptual environments we have identified here. Published dream reports indicate that typical environments predominate lucid dreamers' perceptions, although we have encountered cases where this is not true for single individuals, and it seems likely that individuals will have characteristic distributions of environment type. For example, 52%, 96%, and 17% of DDG's lucid dreams had at least one scene with minimal, normal, and surreal environments, respectively; the figures for SLB are 16%, 92%, and 5%. Although the great majority of both authors' lucid dreams take place in normal environments, DDG's were significantly more likely to have minimal and surreal environments as well. The differences in frequency are even more striking if we consider the extreme case of minimal environments, the void, without any content at all; DDG, 32% vs. SLB, 3%.

4. Perceptual Variation in Specific Sensory Modalities

Within the context of one of the three varieties of perceptual environment just reviewed, the specific contents of consciousness in different sensory modalities can vary from the normal to the bizarre. Thus, for example, a particular lucid dream may take place in an environment that is almost entirely normal, with the exception of a single element of the sensory array. Or everything may appear perfectly normal if considered individually, but quite anomalous when considered in context. For example, van Eeden (1913) describes experimenting with breaking a claret-glass in a lucid dream: "It broke all right, but a little too late, like an actor who misses his cue. This gave me a very curious impression of being in a fake-world, cleverly imitated, but with small failures."

The factors affecting the variations in lucid dream perceptual bizarreness and their frequency of occurrence have yet to be investigated. Here we will very briefly review some of the variations in perceptual experience and bizarreness in several sensory modalities.

a. Vision

Although the visual contents of most lucid dreams seem quite normal, there are some aspects of the visual experience that do not operate in the same way as in waking perception. For example, the Marquis de Saint-Denys observed that he was often unable to alter the level of illumination in his lucid dreams (see LaBerge, 1985), an effect termed the "Light-Switch" phenomenon by Hearne (1987).

(SLB1029) "…[in a lucid dream] I remember the light task and look around for a switch. I find a table lamp and flick it's switch on: it dimly illuminates. I switch it off and it goes off. I try willing it to light, focussing my willpower on the bulb, but no luck. Then I try another lamp, a halogen desk lamp. I turn the on knob and it dimly lights (about as bright as in waking imagination). Twist off and off it goes. Magical will power has no effect, again.."

Visual bizarreness in the geometry of the dream environment (allocentric space) is described clearly by lucid dreamers, as the following two examples illustrate:

(DDG20) "It didn't strike me at the time, but what was weird was how the ghoul was positioned in my backyard and the angle I was viewing him from out my window. He was standing at the corner of my room on the outside, with its side facing in my direction and its front facing towards the street and its back facing into the backyard. What I didn't realize until I woke up and wrote this is that there is no way I could see someone if they were standing in this position physically. After waking, I tried to look out my window from where I was standing in my room in the lucid dream, and you simply can't see that corner of the house. I had to put my face right up to the window and turn my head to see that position from my window. But in the lucid dream I could see that position perfectly standing back a few feet from the window."

(DDG43) "I looked up at the ceiling and got a nice visual surprise. The hallway seemed to repeat itself upward and curving out of sight, like the effect of two mirrors up against each other, except there were no mirrors."

The visual texture of objects is highly variable in lucid dreams. Scenes can take on appearances ranging from highly realistic to "cartoon-like". Lucid dreamers frequently report that dream objects appear to be "glowing" as if self-illuminated. The visual texture of whole dream environments can take on drastically different appearances in lucid dreams, usually accompanied by distinctive affect, as the following examples indicate:

(DDG76) "Standing on the lawn I saw a white picket fence running up the walk to the front door. Across the street was a lake and beyond the lake an amazing horizon of sun and colors. Everything seemed to have a pinkish red tint to it. The colors were like soft delicate pastels. A warm breeze was blowing. My movements were like slow motion as I walked through the front yard (not the slow motion kind of movement that makes it difficult to move, but a slow motion in the sense of being very dream like). My thoughts seemed very removed from my situation. The whole thing seemed to be beautifully unreal…."

(SLB355) "…I find myself on a street (not at first aware that I'm dreaming). Then after a few seconds I realize that I am dreaming again. I fly up into the warm air towards the sun. But it always seems out of reach. I fly over mountains and then the sea and, as I continue to try for the sun, weird volcanic-organic forms sprout up from the ocean. Gradually this bizarre fractal-coral creature's transformations dominates the scene and the sun is above my field of vision. I find myself

sinking into the water. I no longer seem to be able to fly and feel continuously more constrained by the dream…."

As in nonlucid dreams, visual aspects of dream characters, objects and environments in lucid dreams can transform visual appearance. In some cases, the effect of such transformations is similar to the familiar morphing process popular in computer graphics (DDG61), in other cases, the transformation is more abrupt, a discontinuity (DDG18). Often, discontinuities of perceptual environments involve a change in the visual setting of the dream contrary to the dreamer's expectation (DDG18):

(DDG61) "...I was glad to have gotten her attention. But then I noticed as I was staring at her face, that her features kept shifting from that of an old lady to that of a beautiful young woman."

(DDG18) "Through the window I saw that it was raining outside. I desired to experience this astral rain. I tried to pass through the wall to get outside but I couldn't. The window was open, but there was a screen blocking my way. I tried to open the screen but couldn't, so I decided to tear the window out. I smashed through it but the hole was too small to crawl through, so I tore away the wall around the window. But the hole was still too small to pass through! So I tore down the whole kitchen wall! Now the hole was big enough to climb through and I jumped through it. But I wasn't outside! Instead, I was in a strange and unfamiliar hallway. I turned around and the kitchen with the hole in the wall was gone! I was in some kind of hallway that looked like an apartment building."

Lucid dreamers report that reading, and especially re-reading, of text in lucid dreams can present challenges. Here is Oliver Fox's description: "…reading [in lucid dreams] is a very difficult matter. The print seems clear enough until one tries to read it: then the letters become blurred or run together, or fade away, or change to others" (1962, pg.46). If comprehended initially, the text, upon rereading, can change in either form, lexical structure, semantic structure, or based on rhyme and alliteration (LaBerge, 1996). Here are some examples:

(DDG53) "I saw a bulletin board and went and tried to read it. I managed to read, with great difficulty, one line of what looked like a flyer announcing a party. I tried to reread the line so as to memorize it, but it now read something completely different. Familiar with this kind of thing, I gave up trying to read."

(DDG13) "I noticed a sign in front of a building and got the idea to go try to read it... The sign was on some steps leading into a building and I got the sense that it was some kind of official sign. I tried to read it but had a very difficult time. I could not get it into focus that easily. All I could make out were the letters 'OR', which for some reason I interpreted to mean Oregon, and, with difficulty I read the statement 'Cheyan Country'. At that moment I thought to myself 'This sign is senseless.' I gave up my attempt to read the sign and walked back down the steps somewhat shaken up."

There are other occasions in which lucid dreamers read dream material that is coherent and even especially meaningful as in the following example:

(SLB592) "Exploring around a grand old hotel that for some reason I take to be 'Freud's Hotel'. Fully lucid, I find a piece of paper that appears at first to be a prescription, but upon closer inspection now seems the will or legacy of Anna Freud. On the paper I read the words:

TO DUST, WE MUST;
TO LIGHT, WE MIGHT."

Variations in dream reading presumably occur because the brain creates dreamed text without any external source of visual information, resulting in unstable perceptions of dream text. The relative roles of individual differences versus expectation in the variations of dream reading has yet to be determined.

b. Audition

Sound may be experienced during WILDs, in the transition from waking to sleep, in the form of cracking, hissing, twinkling, or similar sounds, sometimes reported as "haunted house" sounds. These are auditory forms of hypnagogia. Lucid dreamers have reported hearing songs during lucid dreams, as if a radio was playing, when in fact, there was no other source of the perception of music using other modalities. Subjects experiencing sleep paralysis have reported hearing voices, sometimes of a threatening or terrifying nature, reminiscent of the auditory hallucinations of schizophrenics. Lucid dreamers also frequently experience playing music:

(SLB270) "In a 'high-school dream' that has become lucid, I walk up to the teacher who is demonstrating something on the piano as if I am an expected guest artist and sit down to play. I think of playing something from a book, but find that my vision is too weak. So I improvise a Fantasy in F#m, starting out prosaically enough, but building up gradually to a terrific climax. The dream fades with the last chord…."

There are infrequent reports reminiscent of fluent aphasia by lucid dreamers.

(DDG76) "He said something about getting into a fight with his Dad. I asked him where he was from and he said 'the Land-O-Lakes, from Idaho.' I asked for his address but he mumbled nonsense. He told me his name but I can't remember it now."

However, reports containing aphasic qualities are rare, and even in (DDG76) word comprehension was mixed with incomprehension. Generally, auditory conversation with dream characters is marked by lexical, syntactical and pragmatic accuracy (Meier, 1993).

c. Somatosensation

There is strong variability in somatosensation during lucid dreams. Variations in somatosensation are prevalent during initiation of WILDs where, during the transition from waking to lucid dreaming, the person may experience any of the following somatic sensations: vibrations, tingles, waves of warmth, a sense of melting, floating, peeling, flipping over, flopping, slipping, and sinking. Once in a lucid dream, there may be variations in perceptions of a body image, ranging from being a disembodied point or freely moving center of awareness (but still immersed in the perceptual environment), to perceiving in full detail that one is in a body and fully immersed in one of the varieties of perceptual environments. Autoscopy is reported in which the lucid dreamer may see his or her body as if looking at it from the outside. All of these variations in somatosensation have been proposed, at one time or another, as criteria to distinguish out-of-body experiences from lucid dreams (e.g. Gabbard and Twemlow, 1984; Irwin, 1988). There is little justification for this distinction (Levitan and LaBerge, 1991) and it seems most reasonable to simply recognize that there is a wide variability of somatic sensations associated with lucid dreaming. Some of these embodiments can seem very strange indeed as in the following two cases:

(SLB308) "I have been telling an improvised version of the story of Fatima the Spinner and the Tent. Through a forgotten transition, my awareness has come to rest within a collection of porcelain plates and china. Queen Fatima is walking through the gallery and I begin to communicate with her

by rattling my plates. All the while I am fully aware that I'm dreaming. The courtiers try to stop the rattling, believing an earthquake to be taking place… Then I believe I have awakened during–an earthquake! I find the apparent incorporation of the earthquake in my dream interesting until I actually awaken a few moments later."

(SLB880) "After lying on my back for a long while, still seemingly awake, I suddenly feel as if I've turned into a bluish gas: actually a cloud of coarse blue spheres in the general form of my body that floats above the bed…"

Tholey (1988) describes a very interesting phenomenon in which the lucid dreamer's "ego" leaves his dream body and "enters into another dreamer figure". The result can be a more complete degree of interpersonal understanding than usually results from such techniques as dialoguing with dream figures. Tholey reports that it is also possible to "slip into different dream figures, one after the other, during lucid dreaming, and to conduct a dialogue with a dream figure that one has left with the ego consciousness" (p. 284).

A particular kinesthetic sensation is reported by lucid dreamers but not nonlucid dreamers: this is a sensation of being uncontrollably dragged or whisked along by a "force", sometimes described as a "strong wind", which carries the lucid dreamer through the dream environment:

(DDG31a) "I floated up through the roof to the outside. Suddenly, I lost my ability to fly, and I began to be pulled along by a strong force, that was like a strong wind gust. This force pulled me violently towards the house next door and I shut my eyes in fright, fearing that I was going to smash into the wall. But then, I just passed smoothly through the wall as the wind force continued to pull me along. I had a momentary glimpse of the inside of the house before I was pulled up through the roof of this house."

Hobson and coworkers have suggested a motor-control theory of dreams in which PGO-initiated stimulation of vestibular and motor pathways generates dreamed motion in a random fashion (Hobson, 1988). Such phasic REM events are a potential explanation of the uncontrolled kinesthesia experienced in lucid dreams described here. However, lucid dreamers, to our knowledge, do not report autonomic sensations associated with vestibular activation in lucid dreams. For example, spinning is quite common for lucid dreamers (used as a technique to stabilize the dream sensorium) but this does not typically produce sensations of vertigo. Thus, it may be that vestibular pathways do not directly affect dream consciousness, and somatic sensations are generated at the level of sensorimotor cortex.

Sleep paralysis is commonly reported both by nonlucid and lucid dreamers. Sleep paralysis involves the intrusion of peripheral somatosensory input associated with REM atonia into the dreamer's consciousness. Closely related to sleep paralysis is the commonly reported feature of the difficulty of moving or talking in dreams, often when the dreamer is subject to a threat. This feature is also reported by lucid dreamers, and again suggests intrusion of peripheral somatosensory afferent information into dream consciousness.

d. Other senses

Lucid dreams can contain content in every sensory modality, including temperature, pain, olfaction, and gustation. Most of these modalities are somewhat rare in lucid dreams, just as they are rare in waking life; but all are possible. Here is an example from van Eeden (1913):

On Sept. 9, 1904, I dreamt that I stood at a table before a window. On the table were different objects. I was perfectly well aware that I was dreaming and I considered what sorts of experiments I could make. … Then I saw a decanter with claret and tasted it, and noted with perfect clearness of mind: "Well, we can also have voluntary impressions of taste in this dream-world; this has quite the taste of wine."

According to folk-lore, a dream pinch is supposed to be painless. LaBerge and Levitan (1998) tested this idea by asking lucid dreamers to induce several somatosensory experiences (pain, pressure and light touch) through dream actions and then awaken and rate the results on a seven-point scale for intensity, discomfort, and pleasure. The same procedure was also followed in waking and in imagination. The results showed a notable deficiency in the reproducibility of the conscious experience of pain on demand in lucid dreams (mean discomfort 1.5 in dreams vs. 3.9 in waking; $p<.05$). The subjects had much better success at eliciting lucid dream sensations of pressure (means of 2.9 in dreams, 3.7 in waking) and light touch (mean=3.2 in dreams, 3.0 in waking). These findings suggest that, while some sensory experiences are well modeled by the brain in the absence of primary sensory input, pain may be a special case. To experience convincing realistic pain in dreams, the brain may require some peripheral somatosensory input that may be interpreted as pain. Lest this study be misunderstood to suggest that one cannot experience pain in dreams, here is the testimony of one of the subjects to the contrary:

(C. S.) However, as soon as I knew I was dreaming, I remembered the experiment... so I stopped and pinched my left forearm with my right hand. At first, I didn't feel anything but the touch. So, I pinched myself as hard as possible. The pain was so extreme that I yelled out "Oh my God!" … the sensation of pain [was] so severe … that I woke up.

On the other hand, the finding that it is easier to experience pleasure than pain in dreams is an intriguing result demanding explanation, and in any case, good news for lucid dreamers.

C. Emotions

Emotion in lucid dreams, while generally positive or relatively neutral, can vary over the entire range of human emotions from agony (mitigated by the realization that "it is only a dream") to the unmitigated ecstasy of sexual or religious bliss. The realization that one is dreaming is frequently accompanied by an unmistakable sense of excitement and delight. For Rapport (1948), the emergence of lucidity "instantly" transformed his dream into "an incommunicably beautiful vision." Fox (1962), described the onset of his first experience of lucidity: "instantly, the vividness of life increased a hundredfold...never had I felt so absolutely well, so clear brained, so divinely powerful, so inexpressibly free!" Not surprisingly, the emotions felt in lucid dreams often carry over into the waking state as in the following example:

(SLB1027) I had somehow gotten myself out on a limb as it were: at the end of a girder high above the street below. I was trying to choose between walking or crawling. Both seemed too risky and I looked around for other alternatives. I observe that behind me is another way I can escape. I climb off the end of the girder onto another ledge and start to work my way through cobwebs in another passageway. I believe I was partially lucid during this because I have a false awakening in which I am telling someone about the preceding dream. I describe letting go of my mental set of going back on the beam the way I came. At the words "letting go" I realize that I'm dreaming again and that the real solution is to trust and let go. As I do so, leaping into the beautiful sunrise sky, I am overwhelmed with feeling and awaken with tears of joy.

Emotional arousal, whether associated with the excitement of lucidity onset or for any other reason, presents lucid dreamers with a problem: Experience of strong emotion within a lucid dream may increase sensations of instability and lead to fading from the lucid dream. Thus, prolonging the lucid dream state requires a degree of emotional control. According to Celia Green (1968: 99), "Habitual lucid dreamers almost unanimously stress the importance of emotional detachment in prolonging the experience and retaining a high degree of lucidity."

A second problem of emotional involvement is that the lucid dreamer's consciousness may be reabsorbed by the dream, and as the lucid dreamer becomes emotionally absorbed, re-identify with the dream role. This amounts to a displacement of the lucid dream context by a nonlucid dream context. This is a problem more often encountered by beginners than experienced lucid dreamers, and through practice and experience, one can learn to maintain lucidity in spite of intense and emotional involvement with the dream.

D. Cognitive Functions

Characterizing variations in cognition during lucid dreaming is both subtle and complex. Not only can variations in cognition occur amongst lucid dreamers, cognition can also vary for a single individual from lucid dream to lucid dream, or within the same lucid dream. Because lucid dreaming is a cumulative skill modified by experience and practice, this means there will always be at least some degree of continuous variation underlying the cognition of lucid dreamers, reflecting changes in the psychological development of that individual both with respect to lucid dreaming, and in general. Nonetheless, variations in cognition within lucid dreaming can be due to other factors including the subject's semantic framework and contextual competition, affecting in particular memory access and thinking.

1. Variations in Memory

Access to memories of waking experience can vary, in spite of the lucid dreamer's intention to access those memories. For example, a lucid dreamer may be unable to recall one's phone number, or the date, or even one's name, in a given lucid dream, although such memories may have been accessed in other lucid dreams. On the other hand, sleep laboratory subjects can remember to perform complex tasks during lucid dreams, tasks which had been previously planned and/or rehearsed during waking. Thus, variations in voluntary access to waking memory may be partly due to intrinsic factors, such as the degree of cortical activation in a given lucid dream or the degree of competition from elements outside the lucid dream context, and partly due to prior preparation and priming of memory.

Levitan and LaBerge (1993) tested memory for four different tasks in a group of 20 lucid dreamers. The tasks and percent of successful recall were: where one is sleeping (95%), the current date (94%), and arbitrary word learned before bed (100%), and a fact that one could not remember previously while awake despite multiple efforts (19%).

2. Variations in Thinking

The thoughts, conceptions, metacognitive reflections and expectations of lucid dreamers are strongly conditioned by the dreamers' semantic framework. Within a given semantic framework, the quality of lucid dreamers' thinking tends to be consistent. However, the use of different seman-

tic frameworks results in more or less accurate conceptions of the lucid dream experience. For example, lucid dreamers who conceptualize their lucid dreams as out-of-body experiences (OBEs) may tend to confuse physical and dream objects, and may operate under the assumption that what they perceive in their lucid dreams corresponds to physical reality (LaBerge, 1985). People who conceive of their lucid dreams as astral projections may come to similarly flawed conclusions. Within the astral projection lore, it is commonly taught that characters encountered during astral projections are the souls of the deceased (Leadbeater, 1895, Fox, 1962, Monroe, 1985). Thus, the astral projector may act as if dream characters are "real" and not mental representations. These examples illustrate that what could be mistakenly taken for a flaw in thinking during a lucid dream is not necessarily a defect in thought per se, but a consequence of the lucid dreamer operating in a specific semantic framework. In such cases, it is the semantic framework that is flawed, not the dreamer's ability to think or reason. Because of the tremendous perceptual diversity of lucid dreams, the variations on this theme are boundless. Considerations of an individual's semantic framework also apply to near-death experiences (NDEs), which have phenomenological overlap with lucid dreams. NDEs are characterized by autoscopy, lucidity, and surreal perceptual environments such as the experiences of perceiving white light, or moving through a tunnel (Greyson, 1993). NDEs are often interpreted in a religious context as proof of life after death (Reader, 1995). Again, the emphasis here is that individuals' semantic frameworks will affect their interpretation of events and behavior in lucid dreams and phenomenologically similar states.

The semantic frameworks used by individuals is not confined to their lucid dream experiences but also has consequences for their waking life. Because lucid dreams are not widely understood in our society, and because of the variety of semantic frameworks available, some peoples' responses to their lucid dream experiences may alter the course of their waking lives. Furthermore, these individuals can influence the beliefs of others and thereby replicate their semantic framework within the wider culture. The elaboration of these notions involves the study of biographies of individuals who have undergone lucid dreaming but interpreted these as something else. This topic is beyond the scope of this chapter, but the interested reader can find sources illustrating these points (e.g. Lutyens, 1975; Monroe, 1985; Tillett, 1982).

On the other hand, lucid dreamers can display alterations in thinking that are not in any obvious way the direct result of operating under a specific semantic framework (Barrett, 1992; Levitan, 1994). These alterations in thinking resemble minor lapses in rationality, unclear thinking, and drawing absurd conclusions. Several factors can account for these belief-independent variations in thinking: (1) the lucid dreamer's degree of experience is such that the lucid dreamer has not yet learned what is and is not appropriate behavior in a given dreamed circumstance, (2) competition from nonlucid dream contexts provided distractions that absorb the dreamer into a dream narrative, and influence the dreamer's thought processes toward this narrative, and (3) variations in brain activity during the course of the lucid dream could alter the performance of higher level cognitive tasks such as comprehending situations and formulating responses.

There is sometimes no obvious difference between belief-dependent and belief-independent variations in thinking when viewing isolated dream reports. Ascertaining these requires knowing a lucid dreamer's semantic framework and taking this into account when judging the quality of the thinking reported during lucid dreams.

E. Volition and Action

There is more voluntary choice available to lucid dreamers than to nonlucid dreamers. The experienced lucid dreamer seems capable of exercising at least as much free choice while dreaming as waking. However, waking volition is constrained by general knowledge and past experience. Likewise, volition during lucid dreams is constrained by the dreamer's semantic framework and past lucid dream experience. These factors together define to the lucid dreamer what is and is not possible, and therefore, what voluntary choices are available. The set of these possible choices are contained in the lucid dreamer's goal-options context.

The actions of lucid dreamers vary from simple to complex. A lucid dreamer's actions may be reflexive, as when walking in a lucid dream without losing balance. Others are instinctive, such as attempting to avoid threatening situations. Still others are habitual, such as speaking or driving a car or performing other procedural tasks in a dream. Finally, some of the actions are deliberate and based on volitional choice. Volitional actions are initiated by the lucid dreamer for any number of reasons: curiosity, desire, etc.

The actions of lucid dreamers are not constrained by the real world either physically or socially. Hence, lucid dreamers routinely fly, pass through walls or perform other actions impossible in the physical world as the following passage indicates:

(DDG54) "I stared up at the big window before me and there was nothing on it indicating that I could open it. So then I did a very interesting trick to get out through the window. I stared at the window and "bent" my perspective on the window so that there was now a gap between the window and the wall that was large enough for me to climb through. I hovered up out of the chair, ignoring the nurse, and pulled myself through the opening I had just created. I was wiggling through the hole wondering what the nurse and other people in the room were thinking."

Lucid dreamers can also freely violate social mores, and behave in highly uninhibited fashions. This can provide a form of therapy to lucid dreamers in terms of overcoming anxiety, recognizing habitual patterns of social interaction, and developing self-knowledge, as well as simply providing a form of pleasure and entertainment (LaBerge and Rheingold, 1990).

The characterization of the actions of lucid dreamers is subsumed under the notion of "dream control". A distinction can be drawn between two kinds of dream control (LaBerge, 1985). One type involves magical manipulation of the dream environment or of dream characters other than the dream actor. The manipulation of the window in (DDG54) is an example of magical manipulation of the dream environment. The other kind of control open to lucid dreamers is self-control, exercised over one's own actions and reactions to events occurring in the lucid dream.

Contrary to some descriptions of lucid dreaming, lucid dreamers typically do not have complete volitional control over their lucid dreams. The most important factor in this regard is that lucid dreamers do not necessarily have control over the perceptual environment in which they find themselves. Like nonlucid dreams, lucid dreamers often find themselves in novel and completely unfamiliar environments which they had no intentional control over creating. This is particularly true of surreal lucid dream environments; here lucid dreamers often cannot even comprehend what they are experiencing (as in DDG75 and DDG70 above). Likewise, lucid dreamers do not intentionally desire to appear in minimal sensory environments, and often have no control over this happening. Thus, lucid dreaming is less like a fantasy experience and more like an exploratory experience.

There are also limits to the actions of lucid dreamers, particularly with respect to magical manipulations. For example, the attempt to fly during any given lucid dream may be met with varying degrees of success. The lucid dreamer may fly readily, merely hover, or not be able to fly at all. Likewise, a lucid dreamer may not always be able to pass through walls (as illustrated in DDG61). Thus, because the lucid dreamer may have performed such acts in previous lucid dreams, the inability to perform such an act will often be met with confusion. This variability in performance of actions from lucid dream to lucid dream appears to be belief-independent because, for example, a lucid dreamer may remember that he has flown before, and will expect to fly, but then cannot fly in the current lucid dream. It is reasonable to hypothesize that variations in performance of actions during lucid dreams reflects underlying variations in REM brain activity.

There are also situations where the dream environment itself imposes actions on the lucid dreamer completely outside the dreamer's intentions or expectations. We have presented examples of this in preceding sections: the need to maintain stability is perhaps the most general non-volitional action with which lucid dreamers are faced. Here, lucid dreamers must control their emotions, and often take steps to stabilize themselves (through spinning or other techniques) in order to prolong their lucid dreams. The kinesthesia experienced as being carried by a strong wind (DDG55 and DDG31a,b above) also occurs outside the will and intention of the lucid dreamer. Often, perceptual discontinuities, such as illustrated in (DDG61) will occur in spite of the lucid dreamer's intention and are often met with surprise by the lucid dreamer.

To suggest that the lucid dreamer "unconsciously" desires or wills experiences that are outside the dreamer's conscious intentions does not offer a credible explanation of these forms of lucid dream variability. It would appear that events and actions occurring in lucid dreams are a combination of: (1) those intentionally generated by the lucid dreamer, limited by the dreamer's experience and knowledge and (2) those generated by the dream environment outside of the conscious knowledge and intention of the lucid dreamer.

With respect to unintended actions generated by the dream environment, these events and actions must in some way be related to the occurrence of physiological phenomena in the sleeping brain. This is clearly the case with sleep paralysis in which peripheral atonia intrudes into the dreamer's consciousness unintentionally. A second example, the sensation of being uncontrollably whisked along by a "wind force" may be a subjective correlate of localized miniature seizure activity in somatosensory cortex, which itself may be grounded in the random brainstem neurotransmission so actively advocated by Hobson and his followers as a basis for dream generation. Another example highly suggestive of the involvement of neurophysiological processes is when a lucid dreamer "fades" from a lucid dream: there is a relatively stereotyped loss of conscious sensory modalities (LaBerge, DeGracia, et al 1998). These fade in the order of vision followed by somatosensation and audition. This suggests a pattern of cortical deactivation from occipital cortex followed by a medial to lateral and caudal to rostral deactivation in the temporal and parietal cortices, respectively. Together, these examples indicate that unconscious brain physiology can intrude into the consciousness of lucid dreamers, forcing unintended actions on the lucid dreamer.

There are Tibetan traditions of lucid dreaming dating from the Ninth Century which claim that a person can achieve complete control of the dream environment (LaBerge, 1985); similar claims are commonplace in Western occult lore (e.g. Leadbeater, 1895). However, no one in the modern era has demonstrated this capability. It is perhaps reasonable, given the evidence at our disposal, to recognize that actions and events occurring in lucid dreams are due to a complex combination of psychological and neurological factors. This, of course, does not preclude testing the limits of possibility in lucid dreams. Indeed, teasing apart the relative roles of neurology and psychology in lucid

dream experiences could provide significant insight into the workings of the mind and brain and further our understanding of the relationship between subjective experience and neurological events.

F. Termination of Lucid Dreams

Sooner or later, all things end, and lucid dreams are no exception. There are two general possibilities for terminating lucid dreams: lucidity is lost while the dream continues, or the lucid dream ends with an awakening. The first mode we have discussed above and involves displacement of the lucid dream context by a nonlucid dream context. Novice lucid dreamers are particularly susceptible to loss of lucidity and may need to explicitly remind themselves that they are dreaming (LaBerge & Rheingold, 1989). With experience, some lucid dreamers learn to maintain lucidity without any special effort (e.g., SLB; The percentage of lucid dreams in which lucidity was lost in years 1-3 respectively were 18%, 1%, and 0.4% for SLB, and 17%, 21%, and 40% for DDG, a significantly different pattern).

For more experienced lucid dreamers, lucid dreams are more likely to terminate by awakening than by loss of lucidity. Termination by awakening typically involves the "fading out" sensations discussed above. Ordinarily there is a high degree of continuity of consciousness during this transition. In contrast, there is usually a moment of confusion when dreamers wake from a nonlucid dream, as they make the transition from the nonlucid dreamer to the waking self.

There are two other possible ways in which lucid dreams can come to an end. In one case, the lucid dreamer enters non-REM sleep and ceases dreaming. Typically, if awakened at this point, the dreamer would recall nothing. In the other case, lucidity is lost, and REM sleep continues, with the person dreaming that he or she has awakened. These dreams are usually called "false awakenings" (Green, 1968) and are very commonly reported concomitants of lucid dreams. Sometimes, false awakenings occur repeatedly with the lucid dreamer seeming to awake again and again only to discover each time that he or she is still dreaming. In some cases, lucid dreamers have reported enduring literally dozens of false awakenings before they finally wake up "for real". False awakenings tend to increase in frequency with experience in lucid dreaming. For example, here are the percentage of lucid dreams with false awakenings in years 1-3 respectively were 9%, 13%, and 24% for DDG, and 16%, 31%, and 39% for SLB. The reason for the increase frequency of false awakenings is probably that more experience with lucid dreams leads to the greater expectation that as a lucid dream is about to end that one is about to wake up. Thus the expectation of awakening leads to the dream content of the false awakening. Increased familiarity leads to increased likelihood of recognizing that one is dreaming during a false awakening. The percentage of false awakenings recognized in years 1-3 respectively were 4%, 8%, and 20% for DDG, and 0%, 3%, and 26% for SLB.

IV. Conclusions

Dream experience is innately complex and the waking personality can choose to explore this complexity with a greater or lesser degree of involvement. When there is more involvement of the waking self with one's dream life, one's dreams partake more of lucidity. When lucid dreams are explored, significant variation is discovered, and individual factors underlie a great deal of this variation. Much of the phenomenology we have described above is not understood in either psychological or neurological terms, but it offers intriguing glimpses into the processes underlying conscious experience, and the relationship between subjective experience and neurological processes.

A deeper understanding of the variety of lucid dream perceptual environments may shed light on sensory representations in waking. An understanding of the effects of semantic structures on lucid dream experience underscores the role of belief in subjective perception and behavior. Finally, study of the unintentional aspects of lucid dream action may bring us closer to understanding the generation of dreams, and the relationship between subjective experience and neurological events. We hope this chapter will inspire more comprehensive research on the phenomenology of lucid dreaming experience.

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Lucid dreaming: Psychophysiological Studies of Consciousness during REM Sleep

By Stephen LaBerge, Ph.D.

Lucid Dreaming Physiologically Verified

Although we are not usually explicitly aware of the fact that we are dreaming while we are dreaming, at times a remarkable exception occurs, and we become conscious enough to realize that we are dreaming. "Lucid" dreamers (the term derives from van Eeden, 1913) report being able to freely remember the circumstances of waking life, to think clearly, and to act deliberately upon reflection, all while experiencing a dream world that seems vividly real (Green, 1968; LaBerge, 1985; Gackenbach & LaBerge, 1988). This is all in contrast to the usual past characterization of dreams as typically lacking any reflective awareness or true volition (Rechtschaffen, 1978).

Lucid dreaming is normally a rare experience. Though most people report having had a lucid dream at least once in their lives, only about 20% of the population reports having lucid dreams once a month or more (Snyder & Gackenbach, 1988).

In spite of the fact that most people have experienced lucid dreams, some theoreticians have considered them impossible and even absurd (eg, Malcolm, 1959). In the absence of empirical evidence bearing on the question, most sleep researchers were apparently inclined to accept Hartmann's "impression" that lucid dreams were "not typical parts of dreaming thought, but rather brief arousals" (Hartmann, 1975, p. 74; Berger, 1977). Schwartz and Lefebvre (1973) noted that frequent transitory arousals were common during REM sleep and proposed these "micro-awakenings" as the physiological basis for lucid dream reports. Although no one had put forward any evidence for this mechanism, it seems to have been the predominant opinion (cf. Foulkes, 1974) up until the last few years.

Empirical evidence began to appear in the late 1970s suggesting that lucid dreams occur during REM sleep. Based on standard sleep recordings of two subjects who reported a total of three lucid dreams upon awakening from REM periods, Ogilvie, Hunt, Sawicki, and McGowan (1978) cautiously concluded that "...it may be that lucid dreams begin in REM." However, no proof was given that the reported lucid dreams themselves had in fact occurred during the REM sleep immediately preceding the awakenings and reports. What was needed to unambiguously establish the physiological status of lucid dreams was some sort of behavioral response signaling to the experimenter the exact time the lucid dream was taking place.

We provided the necessary verification by instructing subjects to signal the onset of lucid dreams with specific dream actions that would be observable on a polygraph (i.e., eye movements and fist clenches). Using this approach, LaBerge, Nagel, Dement & Zarcone (1981) reported that the occurrence of lucid dreaming during unequivocal REM sleep had been demonstrated for five subjects. After being instructed in the method of lucid dream induction (MILD) described by LaBerge (1980b) the subjects were recorded from 2 to 20 nights each. In the course of the 34 nights of the study, 35 lucid dreams were reported subsequent to spontaneous awakening from various stages of sleep as follows: REM sleep 32 times, NREM Stage-1, twice, and during the transition from NREM Stage-2 to REM, once. The subjects reported signaling during 30 of these lucid dreams. After each

recording, the reports mentioning signals were submitted along with the respective polysomnograms to a judge uninformed of the times of the reports. In 24 cases (90%), the judge was able to select the appropriate 30 second epoch on the basis of correspondence between reported and observed signals. All signals associated with lucid dream reports occurred during epochs of unambiguous REM sleep scored according to the conventional criteria (Rechtschaffen & Kales, 1968).

A later analysis extending these data with two additional subjects and 20 more lucid dreams produced identical results (LaBerge, Nagel, Taylor, Dement, & Zarcone, 1981). LaBerge et al. argued that their investigations demonstrated that lucid dreaming usually (though perhaps not exclusively) occurs during REM sleep. This conclusion is supported by research carried out in several other laboratories (Dane, 1984; Fenwick et al., 1984; Hearne, 1978; Ogilvie, Hunt, Kushniruk, & Newman, 1983).

Ogilvie et al. (1983) reported the physiological state preceding 14 spontaneous lucidity signals as unqualified REM in 12 (86%) of the cases; of the remaining two cases, one was "ambiguous" REM and the other appeared to be wakefulness. Keith Hearne and Alan Worsley collaborated on a pioneering study of lucid dreaming in which the latter spent 50 nonconsecutive nights in the Hull University sleep lab while the former monitored the polygraph. Worsley reported signaling in 8 lucid dreams, all of which were described by Hearne (1978) as having occurred during REM sleep.

However, demonstrations that signaling of lucid dreams occurs during REM sleep raises another kind of question: What exactly do we mean by the assertion that lucid dreamers are 'asleep?' Perhaps these 'dreamers' are not really dreamers, as some argued in the last century; or perhaps this 'sleep' is not really sleep, as some have argued in this century. How do we know that lucid dreamers are 'really asleep' when they signal? If we consider perception of the external world as a criterion of being awake (to the external world), we can conclude that they are actually asleep (to the external world) because although they know they are in the laboratory, this knowledge is a matter of memory, not perception. Upon awakening, they report having been totally in the dream world and not in sensory contact with the external world.

It might be objected that lucid dreamers might simply not be attending to the environment; rather than being asleep, perhaps they are merely absorbed in their private fantasy worlds as, for example, when deeply immersed in a novel or daydream. However, according to the reports of lucid dreamers (LaBerge, 1980a, 1985), if they deliberately attempt to feel the bedcovers they know they are sleeping in or try to hear the ticking of the clock they know is beside their bed, they fail to feel or hear anything except what they find in their dream worlds. Lucid dreamers are conscious of the absence of sensory input from the external world; therefore, on empirical grounds, they conclude that they are asleep.

If, in a contrary case, subjects were to claim to have been awake while showing physiological signs of sleep, or vice versa, we might have cause to doubt their subjective reports. However, when -- as in the present case -- the subjective accounts and objective physiological measures are in clear agreement, it is embarrassingly awkward to assert (as some critics have done) that subjects who reported being certain that they were asleep while showing physiological indications of unequivocal sleep were actually awake (cf. LaBerge, Nagel, Dement & Zarcone, 1981).

Some critics have suggested that "demand characteristics" might account for our results. It is true that our subjects were under demand to have, signal and report lucid dreams, but how could demand alone account for them doing all three things without having been lucid in the first place? If they merely unconsiously signaled, we would have found REM periods with signals without subse-

quent reports of lucidity -- but we did not. If they merely reported having signaled without actually having done so, we would have found reports without signals, which we did not. Further, by this account, where would the reported and observed signals have come from?

The evidence is clear: lucid dreaming is an experiential and physiological reality; though perhaps paradoxical, it is clearly a phenomenon of sleep.

Physiological Characteristics Of Lucid Dreaming

The preceding studies have shown that lucid dreams typically occur in REM sleep. However, since REM sleep is a heterogeneous state exhibiting considerable variations in physiological activity, of which two distinct phases are ordinarily distinguished. In its most active form, REM is dominated by a striking variety of irregular and short-lived events such as muscular twitching, including the rapid eye movements that give the state one of its most common names. This variety of REM is referred to as 'phasic,' while the relatively quiescent state remaining when rapid eye movements and other phasic events temporarily subside is referred to as 'tonic.' On first thought, one might expect lucid dreams to be associated with decreased phasic activity (Pivik, 1986). However, research by the Stanford group, detailed below, has shown lucid dreaming to be associated with, on the contrary, increased phasic activity.

LaBerge, Levitan, and Dement (1986) analyzed physiological data from 76 signal-verified lucid dreams (SVLDs) of 13 subjects. The polysomnograms corresponding to each of the SVLDs were scored for sleep stages and every SVLD REM period was divided into 30 s epochs aligned with the lucidity onset signal. For each epoch, sleep stage was scored and rapid eye movements (EM) were counted; if scalp skin-potential responses were observable as artifacts in the EEG, these were also counted (SP). Heart rate (HR) and respiration rate (RR) were determined for SVLDs recorded with these measures.

For the first lucid epoch, beginning with the initiation of the signal, the sleep stage was unequivocal REM in 70 cases (92%). The remaining six SVLDs were less than 30 s long and hence technically unscorable "by the book" (Rechtschaffen & Kales, 1968). For these cases, the entire SVLD was scored as a single epoch; with this modification, all SVLDs qualified as REM. The lucid dream signals were followed by an average of 115 s (range: 5 to 490 s) of uninterrupted REM sleep. Physiological comparison of EM, HR, RR, and SP for lucid vs. non-lucid epochs revealed that the lucid epochs of the SVLD REM periods had significantly higher levels of physiological activation than the preceding epochs of non-lucid REM from the same REM period. Similarly, H-reflex amplitude is lower during lucid compared to non-lucid REM (Brylowski, Levitan, & LaBerge, 1989).

In order to study the temporal variations of physiology as they correlated with the development and initiation of lucidity, for each SVLD REM period the physiological variables were converted to standard scores and averaged across dreams and subjects. Figure 1 is a histogram of the resultant mean standard scores for the five minutes before and the five minutes after the initiation of lucidity. Note the highly significant increases in physiological activation during the 30 s before and after lucidity onset.

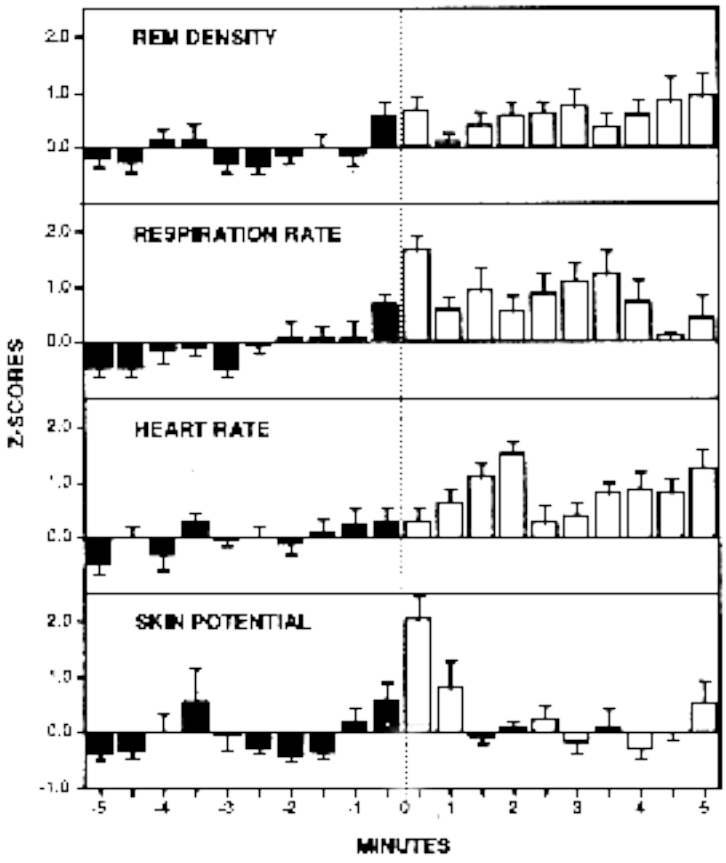

Figure 1. Histograms of grand mean z-scores for EM, RR, HR, and SP.Bins are 30 s in length with t=0 representing the signaled onset of lucidity. Ns vary with variable and bin, but all values are averaged across lucid dreams and subjects. (p<.05)*

Physiological data (EM, RR, HR, and SP) were also collected for sixty-one control non-lucid REM periods, derived from the same 13 subjects, in order to allow comparison with SVLDs. Mean values for EM and SP were significantly higher for REM periods with lucid dreams than non-lucid control REM periods (RR and HR did not differ).

Given the finding that lucid dreams reliably occur during activated (phasic) REM, measures of central nervous system activation, such as eye movement density, should contribute something to the pattern of lucid dream distribution. Since it had been previously observed that eye-movement density starts at a low level at the beginning of REM periods and increases until it reaches a peak after approximately five to seven minutes (Aserinsky, 1971), we (LaBerge et al., 1986) hypothesized that lucid dream probability should follow a parallel development and accordingly found that mean eye-movement density correlated positively and significantly with lucid dream probability ($r = .66$, $p < .01$).

Lucid dreams have been frequently reported to occur most commonly late in the sleep cycle (Green, 1968). LaBerge et al. (1986) tested this hypothesis by first determining for each of their 12 subjects the time of night which divided their total REM time into two equal parts. All but one of the subjects had more lucid dreams in the second half of their REM time than in the first half (binomial test; $p < .01$). For the combined sample, relative lucidity probability was calculated for REM periods one through six of the night by dividing the total number of lucid dreams observed in a

given REM period by the corresponding total time in stage REM for the same REM period. A regression analysis clearly demonstrated that relative lucidity probability was a linear function of ordinal REM period number ($r = .98$, $p < .0001$).

There are two distinct ways in which lucid dreams are initiated. In the usual case, subjects report having been in the midst of a dream when a bizarre occurrence causes sufficient reflection to yield the realization that they are dreaming. In the other, less frequent case, subjects report having briefly awakened from a dream and then falling back asleep directly entering the dream with no (or very little) break in consciousness (Green, 1968; LaBerge 1985a). Here is an example of a wake-initiated lucid dream:

I was lying awake in bed late in the morning listening to the sound of running water in the adjoining bathroom. Presently an image of the ocean appeared, dim at first like my usual waking imagery. But its vividness rapidly increased while, at the same time, the sound of running water diminished; the intensity of the internal image and external sound seemed to alter inversely (as if one changed a stereo balance control from one channel to the other). In a few seconds, I found myself at the seashore standing between my mother and a girl who seemed somehow familiar. I could no longer hear the sound of the bath water, but only the roar of the dream sea.... (LaBerge, 1980, p. 85)

Note that the subject is continuously conscious during the transition from wakefulness to sleep. This fact suggests that Foulkes (1985) is over-stating the case by claiming that it is "...a necessary part of the experience we call 'sleep' that we lose a directive and reflective self. You can't fall asleep, or be asleep, if your waking self is still regulating and reflecting upon your conscious mental state" (p. 42).

Since lucid dreams initiated in these two ways ought to differ physiologically in at least one respect (i.e., an awakening preceding one but not the other), the SVLDs were dichotomously classified as either 'Wake-initiated' (WILD) or 'Dream-initiated' (DILD), depending on whether or not the reports mentioned a transient awakening in which the subject consciously perceived the external environment before re-entering the dream state.

Fifty-five (72%) of the SVLDs were classified as DILDs and the remaining 21 (28%) as WILDs. For all 13 subjects, DILDs were more common than WILDs (binomial test, $p < .0001$). As expected, compared to DILDs, WILDs were more frequently immediately preceded by physiological indications of awakening (Chi-squared = 38.3, 1df, $p < .0001$) establishing the validity of classifying lucid dreams in this manner. See Figures 2 and 3 for illustrations of these two types of lucid dream.

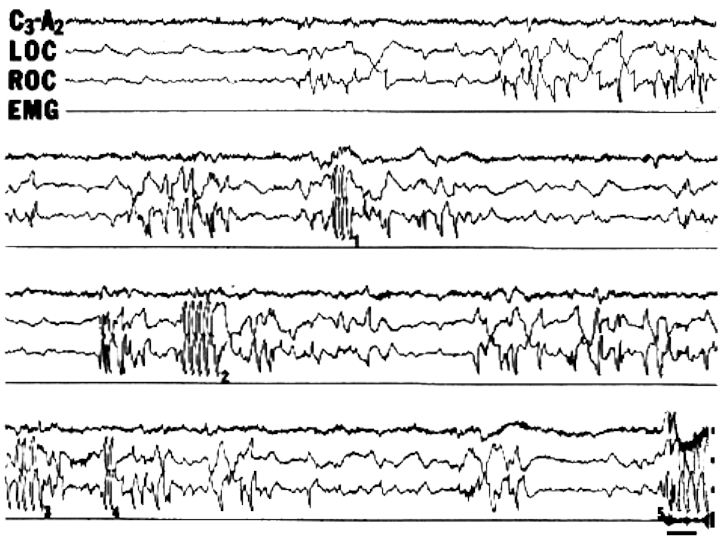

Figure 2. A typical dream-initiated lucid dream (DILD). Four channels of physiological data (central EEG [C3-A2], left and right eye-movements [LOC and ROC], and chin muscle tone [EMG]) from the last 8 min of a 30 min REM period are shown. Upon awakening the subject reported having made five eye movement signals (labeled 1-5 in figure). The first signal (1, LRLR) marked the onset of lucidity. Skin potential potential artifacts can be observed in the EEG at this point. During the following 90 s the subject "flew about" exploring his dream world until he believed he had awakened, at which point he made the signal for awakening (2, LRLRLRLR). After another 90 s, the subject realized he was still dreaming and signaled (3) with three pairs of eye movements. Realizing that this was too many, he correctly signaled with two pairs (4). Finally, upon awakening 100 s later he signaled appropriately (5, LRLRLRLR). [Calibrations are 50 microV and 5 s.]

As was mentioned earlier, momentary intrusions of wakefulness occur very commonly during the normal course of REM sleep and it had been proposed by Schwartz and Lefebvre (1973) that lucid dreaming occurs during these micro-awakenings. However, LaBerge et al.'s (1981,1986) data indicates that while lucid dreams do not take place during interludes of wakefulness within REM periods, a minority of lucid dreams (WILDs) are initiated from these moments of transitory arousal, with the WILDs continuing in subsequent undisturbed REM sleep.

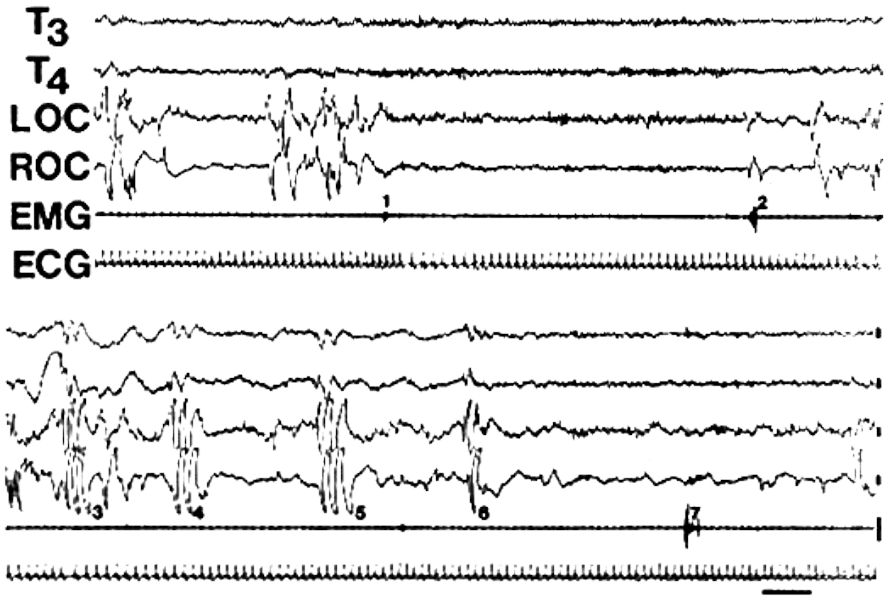

Figure 3. A typical lucid dream initiated from a transient awakening during REM (WILD). Six channels of physiological data (left and right temporal EEG [T3 and T4], left and right eye-movements [LOC and ROC], chin muscle tone [EMG], and electrocardiogram [ECG]) from the last 3 min of a 14 min REM period are shown. The subject awoke at 1 and after 40 s returned to REM sleep at 2, and realized he was dreaming 15 s later and signaled at 3. Next he carried out the agreed-upon experimental task in his lucid dream, singing between signals 3 and 4, and counting between signals 4 and 5. This allowed comparison of left and right hemisphere activation during the two tasks (LaBerge and Dement, 1982b). Note the heart-rate acceleration-deceleration pattern at awakening (1) and at lucidity onset (3), and the skin potential potential artifacts in the EEG (particularly T4) at lucidity onset (3). [Calibrations are 50 microV and 5 s.]

To summarize, an elevated level of CNS activation seems to be a necessary condition for the occurrence of lucid dreams. Evidently the high level of cognitive function involved in lucid dreaming requires a correspondingly high level of neuronal activation. In terms of Antrobus's (1986) adapta-

tion of Anderson's (1983) ACT* model of cognition to dreaming, working memory capacity is proportional to cognitive activation, which in turn is proportional to cortical activation. Becoming lucid requires an adequate level of working memory to activate the pre-sleep intention to recognize that one is dreaming. This level of cortical and cognitive activation is apparently not always available during sleep, but normally only during phasic REM.

Psychophysiological Relationships During REM Sleep

Psychologists attempting to apply rigorous scientific methodology to the study of such phenomena as mental imagery, hallucinations, dreaming, and in general, conscious processes face a major challenge: The most direct account available of the private events occurring in a person's mind is his or her own subjective report. But, unfortunately, subjective reports are difficult to objectively verify and introspection is far from an unbiased and direct process of observation. There are two strategies likely to increase our confidence in the reliability of subjective reports: 1) use highly trained (and in the context of dream research, lucid) subjects who are skillful reporters. 2) use the psychophysiological approach, which makes use of the fact that the convergent agreement of physiological measures and subjective reports provides a degree of validation to the latter (Stoyva and Kamiya, 1968).

Indeed, the psychophysiological approach was responsible for the Golden Age of dream research in the decades following the discovery of REM sleep (Aserinsky and Kleitman, 1953) and the subsequent association of REM with dreaming (Dement and Kleitman, 1957). Although the psychophysiological paradigm of dream research yielded an abundant harvest for many years (see Arkin, Antrobus & Ellman, 1978), it possessed a fatal flaw: as long as the subjects are non-lucid, the researcher has no way of making certain that the subjects will dream about what the researcher might like to study. Pre-sleep manipulations producing reliable effects on dream content have not been highly successful (Tart, 1988). One can only wait and hope that eventually a dream report will turn up what one is looking for. This is really no better than a shot-in-the-dark approach and some researchers have been calling for abandoning the psychophysiological method in favor of a purely psychological approach. An influential researcher has written that "...psychophysiological correlation research now appears to offer such a low rate of return for effort expended as not to be a wise place for dream psychology to continue to commit much of its limited resources" (Foulkes, 1981, p. 249). This conclusion may well be justified, but only insofar as it refers to the psychophysiological approach as traditionally practiced, using non-lucid subjects. The use of lucid dreamers overcomes the basic difficulty of the old methodology, and may revitalize the psychophysiological approach to dream research.

The fact that lucid dreamers can remember to perform predetermined actions and signal to the laboratory suggested to LaBerge (1980a) a new paradigm for dream research: Lucid dreamers, he proposed, "could carry out diverse dream experiments marking the exact time of particular dream events, allowing the derivation of precise psychophysiological correlations and the methodical testing of hypotheses" (LaBerge, Nagel, Dement, & Zarcone, 1981, p. 727). This strategy has been put into practice by the Stanford group in a number of studies summarized below.

How long do dreams take? This question has intrigued humanity for many centuries. A traditional answer was that dreams take very little or no time at all, as in the case of Maury's famous dream in which he had somehow gotten mixed up in a long series of adventures during the French Revolution, finally losing his head on the guillotine, at which point he awoke to find the headboard had fallen on his neck. He supposed, therefore that the lengthy dream had been produced in a flash by

the painful stimulus. The idea that dreams occur in the moment of awakening has found supporters over the years (e.g., Hall, 1981).

We have straightforwardly approached the problem of dream time by asking subjects to estimate ten second intervals (by counting, "one thousand and one, one thousand and two, etc.") during their lucid dreams. Signals marking the beginning and end of the subjective intervals allowed comparison with objective time. In all cases, time estimates during the lucid dreams were very close to the actual time between signals (LaBerge, 1980a, 1985). However, this finding does not rule out the possibility of time distortion effects under some circumstances.

The data reported by LaBerge, Nagel, Dement, and Zarcone (1981) and LaBerge, Nagel, Taylor, Dement, and Zarcone (1981) indicate that there is a very direct and reliable relationship between gaze shift reported in lucid dreams and the direction of polygraphically recorded eye movements. The results obtained for lucid dreams (see also Dane, 1984; Fenwick et al., 1984; Hearne, 1978; Ogilvie, Hunt, Tyson, Lucescu, & Jeakins, 1982) are much stronger than the generally weak correlations obtained by previous investigators testing the hypothesis that the dreamer's eyes move with his or her hallucinated dream gaze, who had to rely on the chance occurrence of a highly recognizable eye-movement pattern that was readily matchable to the subject's reported dream activity (e.g. Roffwarg, Dement, Muzio, & Fisher, 1962).

LaBerge (1986) has carried out related experiments in which two subjects tracked the tip of their fingers moving slowly left to right during four conditions: 1) awake, eyes open; 2) awake, eyes closed mental imagery; 3) lucid dreaming; and 4) imagination ("dream eyes closed") during lucid dreaming. The subjects showed saccadic eye movements in the two imagination conditions (2 and 4), and smooth tracking eye movements during dreamed or actual tracking (conditions 1 and 3).

In another study, LaBerge and Dement (1982a) demonstrated the possibility of voluntary control of respiration during lucid dreaming. They recorded three lucid dreamers who were asked to either breathe rapidly or to hold their breath (in their lucid dreams), marking the interval of altered respiration with eye movement signals. The subjects reported successfully carrying out the agreed-upon tasks a total of nine times, and in every case, a judge was able to correctly predict on the basis of the polygraph recordings which of the two patterns had been executed (binomial test, $p < .002$).

Evidence of voluntary control of other muscle groups during REM was found by LaBerge, Nagel, Dement, and Zarcone (1981) while testing a variety of lucidity signals. They observed that a sequence of left and right dream-fist clenches resulted in a corresponding sequence of left and right forearm twitches as measured by EMG. However, the amplitude of the twitches bore an unreliable relationship to the subjective intensity of the dreamed action. Because all skeletal muscle groups except those that govern eye-movements and breathing are profoundly inhibited during REM sleep for, it is to be expected that most muscular responses to dreamed movements will be feeble. Nonetheless, these responses faithfully reflect the motor patterns of the original dream. Similar observations have been made by Fenwick et al. (1984).

Following reports of cognitive task dependency of lateralization of EEG alpha activity in the waking state by many researchers, LaBerge & Dement (1982b) undertook a pilot study demonstrating the feasibility of similar investigations in the lucid dream state. The two tasks selected for comparison were dreamed singing and dreamed counting, activities expected to result in relatively greater engagement of the subjects' left and right cerebral hemispheres, respectively.

Integrated alpha band EEG activity was derived from electrodes placed over right and left temporal lobes while four subjects sang and estimated 10 seconds by counting in their lucid dreams (marking the beginning and end of each task by eye movement signals). The results supported the hypothesized lateralization of alpha activity: the right hemisphere was more active than the left during singing; during counting the reverse was true. These shifts were similar to those observed during actual singing and counting. In contrast, a control condition with imagined singing and counting showed no significant laterality shifts. Because of the small number of subjects, the conclusions of this study must be regarded as suggestive at best.

LaBerge & Dement noted an important implication of their results for the interpretation of EEG alpha activity during REM sleep. Since continuous alpha activity occurs when a subject awakens, sleep researchers have usually assumed that increased alpha activity in the context of sleep is always a sign of wakefulness or relative cortical activation. The findings just discussed suggest the contrary: alpha activity during REM sleep is, as in waking, inversely related to cortical activation. When a person awakens from a vivid dream to a dark room, his cortical (occipital, at least) activation has decreased, not increased, with the resultant appearance of elevated alpha power.

In this view, it is a straightforward prediction that occipital alpha power during REM sleep will correlate negatively with subsequently reported dream vividness. This could provide the proper explanation for the finding that awakenings following REM periods with high levels of alpha activity are more likely to yield "thinking" reports than awakenings from low-alpha REM periods which yield more "dreaming" reports (Antrobus, Dement & Fisher (1964).

Sexual activity is a rather commonly reported theme of lucid dreams (Garfield, 1979; LaBerge, 1985). LaBerge, Greenleaf, and Kedzierski (1983) undertook a pilot study to determine the extent to which subjectively experienced sexual activity during REM lucid dreaming would be reflected in physiological responses.

Sixteen channels of physiological data, including EEG, EOG, EMG, respiration, skin conductance level (SCL), heart rate, vaginal EMG (VEMG) and vaginal pulse amplitude (VPA), were recorded from a single subject. The experimental protocol called for her to make specific eye movement signals at the following points: when she realized she was dreaming (i.e., the onset of the lucid dream); when she began sexual activity (in the dream); and when she experienced orgasm.

The subject reported a lucid dream in which she carried out the experimental task exactly as agreed upon. Data analysis revealed a significant correspondence between her subjective report and all but one of the autonomic measures; during the 15 second orgasm epoch, mean levels for VEMG activity, VPA, SCL, and respiration rate reached their highest values and were significantly elevated compared to means for other REM epochs. Contrary to expectation, heart rate increased only slightly and non-significantly.

Implications for Research on Sleep and Cognition

The fact of lucid dreaming presents conceptual difficulties for certain traditional beliefs about "sleep" and presumed limitations of dream mentation. In a certain sense, the anomalous appearance of lucid dreaming parallels that of the state that has been called "paradoxical sleep." The discovery of REM sleep required the expansion of our concept of sleep. The evidence associating lucid dreaming with REM sleep reviewed above would seem to require a similar expansion of our concept of dreaming, and a clarification of our concept of sleep.

Fenwick et al. (1984) showed that a subject was able to perceive and respond to environmental stimuli (electrical shocks) without awakening from his lucid dream. This result raises a theoretical issue: if we take perception of the external world to be the essential criterion for wakefulness (LaBerge et al., 1981a; see above) then it would seem that Worsley must have been at least partially awake. On the other hand, when environmental stimuli are incorporated into dreams without producing any subjective or physiological indications of arousal, it appears reasonable to speak of the perception as having occurred during sleep.

Furthermore, it may be possible, as LaBerge (1980c) has suggested, for one sense to remain functional and 'awake' while others fall 'asleep.' Similarly, Antrobus, Antrobus and Fisher (1965) argued "...that the question -- awake or asleep -- is not a particularly useful one. Even though we have two discrete words -- sleep and wakefulness -- this does not mean that the behavior associated with the words can be forced into two discrete categories. ... not only do sleeping and waking shade gradually into one another but there is only limited agreement among the various physiological and subjective operations that discriminate between sleeping and waking. At any given moment, all systems of the organism are not necessarily equally asleep or awake." (pp. 398-399)

As long as we continue to consider wakefulness and sleep as a simple dichotomy, we will lie in a Procrustian bed that is bound at times to be most uncomfortable. There must be degrees of being awake just as there are degrees of being asleep (i.e. the conventional sleep stages). Before finding our way out of this muddle, we will probably need to characterize a wider variety of states of consciousness than those few currently distinguished (e.g. 'dreaming,' 'sleeping,' 'waking,' and so on).

It may be helpful to consider lucidity from a cognitive developmental perspective. According to Piaget (1927), children pass through three stages of understanding of the concept "dream." In the first stage, they believe that dreams take place in the same external world as all other experiences. In the second stage, children treat dreams as if they were partially external and partially internal. This transitional stage gives way to the third stage in which children recognize the dream is entirely internal in nature, a purely mental experience.

These foregoing developmental stages refer to how children think about dreams when they are awake. While asleep and dreaming, children, and also adults, tend to remain at the first stage ¬ implicitly assuming that the dream events are external reality. Out-of-body experiences, with a contradictory mixture of material and mental (external and internal), may provide examples of the second stage (LaBerge, Levitan, Brylowski & Dement, 1988). In the fully lucid dream, the dreamer attains the third stage, realizing that the dream world is distinct from the physical world.

Foulkes (1982, 1985) has emphasised the idea that the growth of mind whether dreaming or awake shows parallel degrees of development: "...there are 'stages' of dream development which individual children reliably pass through one after the other, and that the precise age at which they reach a new stage is at least partially predictable from independent measures of their waking mental development." (1985, p. 137)

Lucid dreaming represents in this view what ought to be a normal ability in adults. If this is correct, why are lucid dreams so rare, especially in cases such as nightmares, where lucidity should be extremely helpful and rewarding? I think a possible answer can be seen by comparing lucid dreaming with another cognitive skill -- language. All normal adults speak and understand at least one language. But how many would do so if they were never taught? Unfortunately, in this culture, with few exceptions, we are not taught to dream.

LaBerge (1980b) has demonstrated that lucid dreaming is a learnable skill and there are a variety of techniques available for inducing lucid dreams (LaBerge, 1985; Price & Cohen, 1988). The Stanford group has experimented with methods for helping dreamers to realize that they are dreaming by means of external cues applied during REM sleep, which if incorporated into dreams, can remind dreamers that they are dreaming (LaBerge, 1980a). They have tested a variety of stimuli, including tape recordings of the phrase "This is a dream," (LaBerge, Owens, Nagel & Dement, 1981) conditioned tactile stimuli, (Rich, 1985) olfactory stimuli, (LaBerge, Brylowski & Levitan, 1986) and light (LaBerge, Levitan, Rich & Dement, 1988). The most promising results so far have been with light stimuli.

The psychophysiological studies reviewed above all support the following picture: During REM dreaming, the events we experience (or seem to) are the results of patterns of CNS activity that produce in turn effects on our ANS and bodies to some extent modified by the specific conditions of active sleep, but still homomorphic to the effects that would occur if we were actually to experience the corresponding events while awake.

This conclusion may need further qualification and explanation. Although the events we appear to perceive in dreams are illusory, our feelings in response to dream content are real. Indeed, most of the events we experience in dreams are real; when we experience feelings, say, anxiety or ecstasy, in dreams, we really do feel anxious or ecstatic at the time. When we think in dreams, we really do think (whether clearly or not is another matter). If we think in our dreams that Monday comes before Sunday, it is not the case, as some philosophers (e.g., Malcolm, 1959) assert, that we have only dreamed we thought; we may have thought incorrectly (to the usual way of thinking), but thought nonetheless.

If we were to vividly imagine a detailed sequence of movements, say, walking around the room, it is probable that motor areas of the brain would be activated in the same pattern as involved in actually walking. However, they would presumably be less activated than when walking. Otherwise, what would prevent us from actually walking when we imagined doing so?

In REM sleep there is a spinal paralysis which causes the muscles of locomotion and vocalization to fail to completely execute the action orders programmed by the brain. Thus, in REM, unlike the waking state, there is no impediment to the brain issuing sequences of motor commands at normal levels of activation, and this probably contributes to the experienced reality of dreamed action.

As for the afferent side of the equation, there is a great deal of evidence suggesting that imagery uses the same neural systems as perception in the corresponding sensory mode (see for example, Farah (1988) and Finke (1980). In this view, the essential difference between a perception and a corresponding image is how the identical neural system acquires sufficient activation to produce a conscious experience. In the case of perception, neural excitation (and the resultant experience) is generated by external input, driving activation of the particular schema to-be-perceived in a largely bottom-up process. In the case of imagining (likewise, hallucinating, or dreaming) the experienced image is generated internally by top-down processes activating the appropriate neural network (schema).

Imaginations and perceptions are normally distinguishable by the fact that images are usually much less vivid than perceptions. Normally, perceptions seem real and images seem -- imaginary. How real something appears depends mainly on its relative vividness and experienced vividness is probably a function of intensity of neural activation. Thus, we may conjecture that images usually involve a lesser degree of neural activation than the corresponding perceptions, and this results in

a lesser degree of experiential reality for imagination. At least two factors contribute to this state of affairs: one is that while we are awake sensory input produces much higher levels of activation than imaginary input. Imagination interferes with perception in the same modality (Perky, 1910; Segal, 1971) and we may suppose the reverse is true as well. Another more speculative factor favoring perceptual processes over imagination in the waking state is the existence of a neural system to inhibit the activation (vividness) of memory images while perception is active. Evolutionary considerations make such a system likely; it would obviously be extremely maladaptive for an organism to mistake a current perceptual image of a predator for the memory of one (LaBerge, 1985). Mandell (1980) has implicated serotonergic neurons as part of a system that normally inhibits vivid images (hallucinations), but is itself inhibited in REM sleep, allowing dreamed perceptions (i.e., images) to appear as vividly real as perceptions. In REM, also, sensory input is actively suppressed preventing competition from perceptual processes.

Perhaps this explains in part why we are so inclined to mistake our dreams for reality: To the functional systems of neuronal activity that construct our experiential world (model), dreaming of perceiving or doing something is equivalent to actually perceiving or doing it.

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Validity Established of Dreamlight Cues for Eliciting Lucid Dreaming

By Stephen LaBerge and Lynne Levitan

ABSTRACT

Lucid dreaming is a learnable, but difficult skill. Consequently, we have sought methods for helping dreamers to realize that they are dreaming by means of external cues applied during REM sleep, which if incorporated into dreams, can remind dreamers that they are dreaming. Here we report on an experiment testing the validity and effectiveness of a portable computerized biofeedback device (DreamLight) designed to deliver light cues during REM sleep. The 14 subjects used DreamLights on 4 to 24 nights. They were unaware that the DreamLights were specially programmed to deliver cues only on alternate nights. Eleven subjects reported 32 lucid dreams, 22 from nights with light cues, 10 from nights without cues. All lucid dreams scored (by judges blind to DreamLight condition) as being "cued" by the DreamLight's stimuli occurred on nights when the DreamLight was actually delivering cues. Subjects reported seeing in their dreams what they believed to be DreamLight cues significantly more often on light cue nights (73 total) compared to nights without light cues (9). The conclusion is that cueing with sensory stimuli by the DreamLight appears to increase a subject's probability of having lucid dreams, and that most of the resulting lucid dreams are due to the specific effect of light cues rather than general "placebo" factors.

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In a lucid dream the dreamer is aware, during the course of the dream, that the experience is a mental construction, not derived from current sensory experience of the physical environment (LaBerge, 1985, 1990). The overwhelming majority of lucid dreams occur during REM sleep. Most lucid dreams begin after the onset of REM sleep, when the dreamer realizes that the current experience is a dream (LaBerge, Levitan, & Dement, 1986). This type of lucid dream, a dream-initiated lucid dream (DILD) is associated with an increase in phasic and autonomic activity in the thirty seconds preceding the onset of lucidity. A minority of lucid dreams occurs when the sleeper enters REM sleep with unbroken self-awareness directly from the waking state. This type is referred to as a wake-initiated lucid dream (WILD) (LaBerge, Levitan, & Dement, 1986).

Once lucid in a dream, people can often choose their actions and exert some deliberate control over the dream content. This ability has been utilized in the laboratory to study lucid dreaming and dream psychophysiology. For example, proof that lucid dreams occur in REM sleep was achieved by having subjects give a prearranged distinct signal with deliberate eye movements to mark the points in time when they realized they were dreaming. The dreamers' reports of the eye movements they had made in the dreams corresponded exactly to their physical eye movements as recorded by means of electro-oculograms on a polygraph record. Reports from experiments conducted using eye movement signaling in lucid dreams can be found in the literature (Dane, 1984; Fenwick et al., 1984; Hearne, 1978; LaBerge, Nagel, Dement & Zarcone, 1981; Ogilvie, Hunt, Kushniruk, & Newman, 1983).

Lucid dreams may be valuable not only for the scientific study of dreaming and REM sleep, but also for a variety of psychological and recreational applications. Anecdotes and preliminary studies suggest that lucid dreaming can be a powerful tool for overcoming nightmares (LaBerge, 1985; Gack-

enbach & LaBerge, 1988; LaBerge & Rheingold, 1990). In therapy, lucid dreams appear to be promising for providing personal insight, assisting with integration, and as a safe environment for experimentation with new behaviors (LaBerge & Rheingold, 1990).

Many lay people are attracted to lucid dreaming because it offers an outlet for fantasy, an opportunity for adventure unfettered by the laws of physics or society, and free of risk. As such, lucid dreaming is for many a source of creative and inspiring recreation. Anecdotes indicate that lucid dreams are helpful for artistic creativity, problem-solving, and practicing skills for waking life (LaBerge & Rheingold, 1990). Furthermore, because dreams are the most vivid mental images attainable by most people, lucid dreaming possibly could be the best method for achieving the benefits of visualization, such as enhancing physical performance and facilitating healing.

All of these potential applications of lucid dreaming merit study. A prerequisite, however, for such research, and for the application of findings, is the ability to reliably and frequently produce lucid dreams. Survey studies have shown that although the majority of college students report having experienced at least one lucid dream, only about 20 percent report lucid dreams once a month or more (Snyder & Gackenbach, 1988).

Lucid dreaming is a skill that can be developed with practice. LaBerge was able to increase his own lucid dream frequency from one per month to four or five per night over the course of three years by using a mental exercise to set his intention to remember to recognize when he was dreaming (the exercise was called "MILD" for Mnemonic Induction of Lucid Dreams) (LaBerge, 1980a,b). In one study with 84 subjects, the use of MILD increased the average number of lucid dreams per week for each subject by 76 percent (from 0.21 to 0.37 lucid dreams per week) over a baseline condition. In the same study, another mental exercise called Reality Testing, involving repeated questioning by the subjects of whether they were awake or dreaming combined with visualization of dreaming, increased average lucid dream frequency by 152 percent (from 0.21 to 0.53 lucid dreams per week) (Levitan & LaBerge, 1989).

Thus, mental techniques are of some use for improving the chances of having lucid dreams. Yet, most people do not have the time and energy for concentration required to learn to have lucid dreams on demand by employing the mental exercises known at present.

An alternative approach to lucid dream induction is to apply sensory stimuli to individuals while they are in REM sleep, to remind them to notice that they are dreaming. This approach is based on the fact that dreamers, while continuing to dream, occasionally perceive some sensory stimuli from the sleeping environment. Sounds, lights, or tactile sensations can become incorporated into an ongoing dream (Dement & Wolpert, 1958).

A few studies have demonstrated that subjects can achieve lucidity by recognizing a sensory stimulus incorporated into a dream as a cue to realize that they are dreaming. This result was obtained with a taped message saying, "This is a dream," or "[Subject's name], you're dreaming," (LaBerge, Owens, Nagel & Dement, 1981) a vibration applied to the bed (Rich, 1985), and flashing lights administered through goggles worn by the sleeper (LaBerge, Levitan, Rich, & Dement, 1988). These experiments were conducted in a sleep laboratory, where a technician turned on the cueing stimulus when the subject's polygraph readout showed unambiguous REM sleep.

The results of the study using light as the cue to become lucid appeared most promising. The light cue induced lucidity 33 times over a total of 58 nights with 44 subjects, as determined by the appearance of a deliberate eye movement signal marking lucidity onset on the polygraph record following the administration of the cue and a dream report by the subject claiming that awareness of

dreaming was prompted by the incorporation of a flashing light in the dream. An additional 11 lucid dreams occurred after stimuli had been applied although no mention of the cue appeared in the subjects' subsequent lucid dream reports. Two out of the three subjects who had never before experienced a lucid dream had one as a result of recognizing the flashing light cue in a dream (LaBerge, Levitan, Rich, & Dement, 1988).

To increase the general usefulness of the technique of cueing lucidity with sensory stimuli, an automated mechanism for detecting REM sleep and applying a cue would be desirable. We have developed such a device, now commercially available, called the DreamLight (note 1). The device detects rapid eye movements with an infrared emitter-detector pair located over the eyelid in a sleep mask, and distinguishes the eye movements of REM from those of waking by also detecting head motion, which only occurs in waking. The signals are processed and a discriminating algorithm is calculated by a 68HC11 microprocessor. When the criterion for identifying REM sleep is satisfied, the device flashes tiny incandescent lamps also mounted in the sleep mask worn by the user.

The current DreamLight device offers a second potential method of attaining lucidity, based on the Reality Testing technique. When the user presses a button located on the mask, it triggers the mask lights to flash briefly and a speaker in the mask to chirp. The button's primary purpose is to initiate a delay period, during which the device will not give stimuli, allowing the wearer to pass through Stage 1 sleep, which physically resembles REM sleep, without being awakened by cues. In trials, it was found that people would dream of awakening wearing the mask, and would press the button (as it appeared in the dream) to find that no flash or chirp happened. Subsequently, instructions to DreamLight users and subjects have included advice to press the button and observe the response of the device (correct flash and chirp versus no response or an anomalous response) anytime they awaken wearing the mask. An incorrect response to the button press indicates that the wearer is dreaming both of being awake and of pressing the button.

During the development of the DreamLight device, a set of prototypes was constructed and testing by subjects sleeping at home. These devices detected eye movements and triggered flashing light cues, but did not distinguish REM from waking. There was no "reality test" button on these devices. They also did not give feedback on how many cues were applied in a night, like the current DreamLights do, so it was difficult to ascertain if they were working properly. Nonetheless, while using these devices, subjects reported an average of 0.12 lucid dreams per night, compared with 0.04 when using no induction method. When subjects combined use of the device with practicing the MILD (Mnemonic Induction of Lucid Dreams) technique (LaBerge & Rheingold, 1990), they reported an average of 0.22 lucid dreams per night (LaBerge, 1988).

The purpose of the present experiment was to examine the effectiveness of DreamLight devices for inducing lucid dreams when used by subjects in their own homes. This study controlled for the possibility of a "placebo" effect--an increase in lucid dream probability resulting from the act of using a device believed by the subject to induce lucid dreams--by comparing lucid dreaming rates when the DreamLights gave cues to rates when the DreamLights did not give cues. In the latter condition, subjects believed that the devices were functioning normally.

METHOD

Subjects

Fourteen subjects participated in the experiment, 10 men, and 4 women. Their ages were between

20 and 50 years. They were selected for their high interest in lucid dreaming, and ability to carry out the experimental protocol correctly. All of the subjects had previous experience with lucid dreaming.

Preparation

Before beginning the controlled experimental protocol, the subjects undertook a preparation period of becoming accustomed to sleeping with the device and adjusting it to suit their individual requirements. This involved adjusting the sensitivity of the detection algorithm so that the device would give a reasonable number of cues (subjects aimed for between 10 and 30 cues per night) and establishing how brightly and for how long they needed the light stimulus to flash so that it would be incorporated into their dreams without causing awakenings. The flash frequency was fixed at two flashes per second. Subjects proceeded to the experimental protocol after finding stimulus parameters that produced at least two recalled incorporations of light stimuli in dreams. The number of nights required to establish proper settings ranged from 1 to 15, with a median number of six.

Protocol

After establishing appropriate cue brightness and length settings in the preparation phase, subjects were to use the same settings throughout the experiment. If a subject decided that it was necessary to change the settings after beginning the protocol, the subjects was to do so only after having used the DreamLight an equal number of times in the A and B conditions (described below) with the particular setting.

The protocol called for the subjects to alternate between using the device in two conditions, labeled A and B. Subjects selected the condition by using a special mode in the DreamLight, and setting it to "Regular," "A," or "B." In Regular mode, the DreamLights functioned normally, giving cues when REM was detected. Subjects used this mode in the preparation phase. In mode B, the DreamLights also operated normally, exactly as in Regular mode. In mode A, the DreamLights did not give cues when they detected REM sleep, although they otherwise operated the same as in mode B (including the same operation of the "reality test" button), so that the subjects could not determine the difference between the modes. The subjects were informed that they were testing two types of DreamLight cues, and they were requested not to try to guess or to find out the difference between the modes.

Subjects used both mode A and mode B between 2-12 nights (median, 5). The protocol nights were completed in 4 to 24 nights (median, 11), not necessarily consecutive.

Throughout the course of the experiment, subjects kept a log, recording data for each night, whether or not they were using DreamLights. The information collected included: the mode used (A, B, or Regular), the number of dreams recalled from the night, the number of lucid dreams recalled, the number of times subjects believed they perceived cues in dreams, the number of lucid dreams in which they realized they were dreaming because they noticed something they believed was a cue incorporation, and the number of lucid dreams in which they realized they were dreaming because of an anomaly of the "reality test" button. The number of cues the DreamLight delivered was recorded in the device's memory.

Subjects also made reports on all of the lucid dreams they recalled during the experiment, including details on how they attained lucidity, and the role of the DreamLight, if any. Two independent judges, blind to the identity of the subjects and the mode conditions used on the nights of the dreams, evaluated these reports to verify that they were true lucid dreams, in which the subjects were explicitly aware of dreaming, and to classify them according to involvement of the DreamLight.

There were three categories of possible DreamLight involvement in the initiation of lucidity. They were defined as follows:

ANY-DL: According to the subject's report, the appearance of the DreamLight in the dream helped the subject to become lucid. This could include appearance of a light or flashing identified by the subject as the DreamLight, a reality test based on pressing the DreamLight mask button in the dream, or appearance of any part of the DreamLight device, as identified by the subject. It must be clear that the DreamLight appeared in the dream before the onset of lucidity and that the subject specifically reflected on or noticed the DreamLight in the dream before becoming lucid. (E.g. saying after the dream that a certain item may have been the DreamLight does not qualify if the subject did not think so during the dream).

CUED: According to the report, the subject became lucid as the result of perceiving a flash or light that the subject identified at that time as being the DreamLight cue. Lucidity onset could be an immediate response to the perceived cue or it could come after reflection of Reality Testing.

RTB: Before becoming fully convinced of being in a dream, the subject attempts to operate the button on the DreamLight mask. The subject becomes lucid after observing that the button does not work correctly, as it would in waking. The subject may be non-lucid or pre-lucid (questioning whether awake or dreaming but not certain) before

pressing the button and becoming lucid.

Each lucid dream report could be classified as belonging to one or more categories or none. All CUED lucid dream reports or RTB lucid dream reports were also ANY-DL lucid dream reports. The judges agreed 100 percent on the ratings of the lucid dream reports. Any lucid dream not fitting one or more of these categories was considered not to have been related to DreamLight use.

RESULTS

Eleven of the fourteen subjects reported at least one lucid dream during the experimental protocol (79%). The total number of experimental nights was 162, with 81 each in mode A (hereafter referred to as the "Q-OFF" condition) and mode B (the "Q-ON" condition). Because subjects contributed unequal numbers of data points to the study, the statistical tests following use mean values per subject (N=14 rather than N=162).

Subjects reported a total of 32 lucid dreams, verified by the judges; 22 (69%) occurred during the Q-ON condition and 10 (31%) during the Q-OFF condition. The mean rate of lucid dreaming per subject per night was significantly higher for the Q-ON condition (0.30 +- 0.24) than for the Q-OFF condition (0.09 +- 0.15) (paired t-test, $t13 = 2.54$, $p < .025$). Eight subjects had more lucid dreams per night in the Q-ON than in the Q-OFF condition, two subjects had equal numbers in both conditions (subjects with at least one lucid dream), and one subject had more lucid dreams per night in the Q-OFF condition (Binomial test, $p < .02$).

All lucid dreams judged to be stimulated by the recognition of an event perceived as a cue by the subject (CUED lucid dreams) occurred during Q-ON condition nights. This accounted for 6 of the 32 lucid dreams recorded (19%). Five subjects (36%) reported judge-verified CUED lucid dreams, all during Q-ON nights (binomial test, $p < .03$). The mean rate of CUED lucid dreams per Q-ON night per subject (0.071 +- 0.10) was significantly greater than the rate (0.00 +- 0.00) for Q-OFF nights (paired t-test, $t13 = 2.53$, $p < .025$). The following are examples of reports classified as CUED lucid dreams:

[1] "I was walking along a road with my boss and the whole scene flashed, cueing me that I was dreaming. I mentioned it to him, and flew a little to prove it."

[2] "One dream, the whole environment lights up for a long time. I become lucid at the cue and remember to do the hand exam [the hand exam was for another experiment]."

[3] "Visit Mom and Dad. Missed flight. Bought new tix, missed that one, too. Very worried about money. Looking over schedules--bright flashes of red. Annoyed at whoever was doing it. Looked around. No possible source of light. Shakily conclude DreamLight. Excited."

Six subjects (42.8%) reported a total of eight judge-verified RTB lucid dreams (lucidity initiated after dreamed "failure" of the "reality test" button). Six (75%)occurred on Q-ON condition nights, and two (25%) on Q-OFF condition nights. The mean number of RTB lucid dreams per Q-ON night per subject was 0.091 +- 0.16, and 0.016 +- 0.04 for Q-OFF nights (paired t-test, $t13 = 1.77$, $p < .10$). Five subjects had more RTB lucid dreams on Q-ON than on Q-OFF nights, and one had more on Q-OFF nights (binomial, $p < 0.10$). The following are examples of reports classified as RTB lucid dreams:

[1] "I'm certain I'm awake in bed, but force of habit warrants that I press the mask button anyway. ... Nothing happens! I know I'm dreaming now, and observe that I am in a fairly good replica of the room I'm sleeping in. I have a momentary thought to pursue sexual activity, but decide against it because someone else is sleeping in the room with me, veridically...."

[2] "I was adjusting the settings on the DreamLight. It occurred to me to press the reality tester. It didn't work. I tried it again and again it didn't work. An electric jolt of excitement ran through my body as I realized I was dreaming."

[3] "I think I'm awake and try to push myself up in bed. I either press the mask button or the mattress, and hear a "boing." I press the mask button again, and get the same faint sound... but "boing" is not right; I must be dreaming!"

Nine subjects (64%) reported lucid dreams fitting into the ANY-DL category, in which the subject related that any occurrence of the DreamLight in the dream resulted in lucidity. The total number of such lucid dreams was 18 (56% of the total). The mean rate of ANY-DL lucid dreams per Q-ON night was 0.174 +- 0.21, and per Q-OFF night was 0.04 +- 0.09 (paired t-test, $t13 = 2.17$, $p < .05$). Six subjects reported more ANY-DL lucid dreams for Q-ON than Q-OFF nights; two subjects reported the opposite, and one subject reported equal numbers (binomial test, $p < .04$). The following are examples of reports classified as ANY-DL lucid dreams, but not also as CUED or RTB lucid dreams:

[1] "I'm watching my cat play on the floor near the bed. She's shredding the papers and boxes and I'm concerned because I don't want her to ruin the DreamLight box. However, I recognize it's not where I left it before going to bed and that it looks different... so this must be a dream."

[2] "While dreaming I lifted my mask and noticed that it was still dark even though it was late in the morning and I knew it was light. I immediately realized I was dreaming..."

[3] "...I hear the radio alarm go off and I hurry to turn it off so R won't have to wake up. I can't seem to silence it however; all the buttons are wacky and now the entire face of the clock has disappeared, leaving the circuitry exposed. I'm beginning to get suspicious and look over at the DreamLight. The screen is lit, but the numbers seem odd. I look back at the clock and between the device. I sense the time is off or strange somehow. Suddenly, it dawns on me that this is a false awakening [a dream of awakening]--that explains everything! Unfortunately, I awaken (truly) almost immediately, as the radio alarm has indeed gone off."

Ten subjects reported a total of 82 incorporations of DreamLight cues into their dreams. These numbers were necessarily estimates, because the subjects were unable to recall all dream content from the nights. The mean number of reported cue incorporations per subject during Q-ON nights was 0.91 +- 1.39 (73 total), and the mean per subject from Q-OFF nights was 0.06 +- 0.16 (9 total) (paired t-test, $t13 = 2.30$, $p < .05$). All ten of the subjects reporting incorporations reported higher rates for Q-ON nights (binomial test, $p < .001$).

The number of dreams recalled per subject was also significantly greater in Q-ON condition nights. The Q-ON condition mean was 3.34 +- 1.54 dreams per night versus 2.68 +- 1.23 per night in the Q-OFF condition (paired t-test, $t13 = 2.99$, $p < .01$). Ten subjects recalled more dreams for Q-ON nights than Q-OFF nights; four recalled more on Q-OFF nights (binomial test, $p < .09$).

DISCUSSION

This experiment has shown that the sensory cues given by the DreamLight lucid dream induction device are effective for stimulating the initiation of lucidity in dreams. More than twice as many lucid dreams were reported with cueing activated (the Q-ON condition) than when the DreamLight was used with cueing deactivated (the Q-OFF condition).

That no subjects reported becoming lucid in response to a cue on nights when no cues were given probably indicates that the cues they recognized in their dreams were in fact real incorporations of the flashing lights in the DreamLights' masks. The greater number of lucid dreams initiated by failure of the "reality test" button on nights when the cues were given may be attributable to false awakenings (dreams of awakening) provoked by cues, although this was not examined in the analysis.

The fact that the rate of cue incorporations reported from Q-ON condition nights was more than fifteen times higher than from Q-OFF nights provides further evidence that the subjects were perceiving the stimuli from the devices in their dreams. The increase in dream recall from the Q-ON condition nights over the Q-OFF condition nights, although not predicted, is potentially explicable again as the result of awakenings caused by DreamLight cues.

Based on this study's findings, it is justifiable to conclude that the REM detection and stimulus delivery algorithm, and the stimulus type employed in the DreamLight together constitute an effective means of stimulating lucid dreams. The study does not address the question of how much of an increase in lucid dreaming frequency is achievable with this device, or of how long it takes an individual to succeed at having a device-induced lucid dream. These are prime topics for further research, as are the questions of the optimal cue type, the best time during REM sleep for cue application, and the most effective methods for subjects to use in preparing to recognize the cue in dreams.

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REFERENCE NOTE

1. DreamLight, (R) is a registered trademark of the Lucidity Institute, Inc., patent pending.

Abstract of talk to be presented at the Toward a Science of Consciousness Conference, Tucson, April 9, 1996

Dreaming and Consciousness

By Stephen LaBerge, Ph.D.

Whether awake or asleep, our consciousness functions as a model of the world constructed by the brain from the best available sources of information. During waking conditions, this model is derived primarily from sensory input, which provides the most current information about present circumstances, and secondarily from contextual and motivational information. While we sleep, very little sensory input is available, so the world model we experience is constructed from what remains, contextual information from our lives, that is, expectations derived from past experience, and motivations (e.g., wishes, as Freud observed, but also fears). As a result, the content of our dreams is largely determined by what we fear, hope for, and expect (1, 2).

From this perspective, dreaming can be viewed as the special case of perception without the constraints of external sensory input. Conversely, perception can be viewed as the special case of dreaming constrained by sensory input (1-3). Whichever way one looks at it, understanding dreaming is central to understanding consciousness.

Theories of consciousness that do not account for dreaming must be regarded as incomplete, and theories that are contradicted by the findings of phenomenological and psychophysiological studies on dreaming must be wrong. For example, the behaviorist assumption that "the brain is stimulated always and only from the outside by a sense organ process" (4) cannot explain dreams; likewise, for the assumption that consciousness is the direct or exclusive product of sensory input.

Dreaming experience is commonly viewed as qualitatively distinct from waking experience. Dreams are often believed to be characterized by lack of reflection and inability to act deliberately and with intention. However, this view has not been based on equivalent measurements of waking and dreaming state experiences. To achieve equivalence, it is necessary to evaluate waking experience retrospectively, in the same way that dreams are evaluated. In a recent study of this type (5), we found that compared to waking experiences, dreaming was more likely to contain public self consciousness and emotion, and less likely to contain deliberate choice. But it is notable that significant differences between dreaming and waking were not evident for other cognitive activities, and none of the measured cognitive functions were typically absent or rare in dreams. In particular, nearly identical levels of reflection were reported in both states.

Although we are not usually explicitly aware of the fact that we are dreaming while we are dreaming, at times a remarkable exception occurs, and we become reflective enough to become conscious that we are dreaming. During such "lucid" dreams it is possible to freely remember the circumstances of waking life, to think clearly, and to act deliberately upon reflection or in accordance with plans decided upon before sleep, all while experiencing a dream world that seems vividly real (1, 6). A series of studies to be summarized demonstrates that lucid dreamers can remember to perform predetermined actions and signal to the laboratory, allowing the derivation of precise psychophysiological correlations and the methodical testing of hypotheses regarding consciousness in sleep.

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A Study of Dreams

By Frederik van Eeden

Since 1896 I have studied my own dreams, writing down the most interesting in my diary. In 1898 I began to keep a separate account for a particular kind of dream which seemed to me the most important, and I have continued it up to this day. Altogether I collected about 500 dreams, of which 352 are the particular kind just mentioned. This material may form the basis of what I hope may become a scientific structure of some value, if leisure and strength to build it up carefully do not fail me.

In the meantime, with a pardonable anxiety lest the ideas should not find expression in time, I condensed them into a work of art--a novel called The Bride of Dreams. The fictitious form enabled me to deal freely with delicate matters, and had also the advantage that it expressed rather unusual ideas in a less aggressive way--esoterically, so to speak. Yet I want to express these ideas also in a form that will appeal more directly to the scientific mind, and I know I cannot find a better audience for this purpose than the members of the Society for Psychical Research, who are accustomed to treat investigations and ideas of an unusual sort in a broad-minded and yet critical spirit.

This paper is only a preliminary sketch, a short announcement of a greater work, which I hope to be able to complete in later years.

I will as much as possible avoid speculation, and limit myself to facts; yet these facts, as I have observed them, bring me in a general way to the firm conviction that the theories on dream-life, as brought forward up to today, within my knowledge, are unable to account for all the phenomena.

Let me now give you an attempt at classification of the different forms of dreams, which I myself personally experienced and observed during a period of sixteen years. I have been able to distinguish nine different kinds of dreams, each of which presents a well-defined type. There are of course intermediate forms and combinations, but the separate types can still be recognized in their intermingling.

The first type of dreams I call initial dreams. This kind of dream is very rare; I know of only half-a-dozen instances occurring to myself, and have found no clear indication of them in other authors. Yet it is very characteristic and easily distinguishable. It occurs only in the very beginning of sleep, when the body is in a normal healthy condition, but very tired. Then the transition from waking to sleep takes place with hardly a moment of what is generally called unconsciousness, but what I would prefer to call discontinuity of memory. It is not what Maury calls a hypnagogic hallucination, which phenomenon I know well from my own experience, but which I do not consider to belong to the world of dreams. In hypnagogic hallucinations we have visions, but we have full bodily perception. In the initial dream type I see and feel as in any other dream. I have a nearly complete recollection of day-life, I know that I am asleep and where I am sleeping, but all perceptions of the physical body, inner and outer, visceral or peripheral, are entirely absent. Usually I have the sensation of floating or flying, and I observe with perfect clearness that the feeling of fatigue, the discomfort of bodily overstrain, has vanished. I feel fresh and vigorous; I can move and float in all directions; yet I know that my body is at the same time dead tired and fast asleep.

As the outcome of careful observations, I maintain my conviction that the bodily conditions of the sleeper have, as a rule, no influence on the character of dreams, with the exception of a few rare and abnormal cases, near the moment of waking up, or in those dreams of a second type which I

have classified as pathological, in which fever, indigestion, or some poison, plays a role, and which form a small minority. For myself as the observer, I may state that I have been in good health all the time of observation. I had no important complaints of any nervous or visceral kind. My sleep and digestion both are usually good. Yet I have had the most terrible nightmares, while my body was as fresh and healthy as usual, and I have had delicious peaceful dreams on board ship in a heavy storm, or in a sleeping-car on the railway.

I wish, therefore, to define the true dream as that state wherein bodily sensations, be they visceral, internal, or peripheral, cannot penetrate to the mind directly, but only in the physical, nonspatial form of a symbol or an image.

I purposely avoid as much as possible the words "consciousness" and "unconsciousness." They may be convenient in colloquial language, but I am not able to attach any clear meaning to them. I have no idea what "unconsciousness," as a substantive, may stand for. And I found that I could do with the words memory and recollection and the word personality or person, in the primitive sense of persona (a mask, i.e., the mask worn by players). I do not think it accurate to call the body of a sleeper or a narcotized man unconscious. During my career as a psychotherapist, having by suggestion produced sleep in many people, I learned that the human body may act like a self-conscious person, without any participation of the recollecting mind. We know nowadays that a splitting-up of human personality is possible, not only into two, but into three or more. During my sittings with Mrs. Thompson, we observed that after a trance, in which Mrs. Thompson had been speaking as "Nelly," or as some other control, she herself remembered dreams, which had nothing whatever to do with the things of which she had been speaking to us. Her being could then be said to have been divided into three entities--the body in trance, apparently asleep; the "control," who spoke through her mouth; and Mrs. Thompson, who was dreaming in quite different spheres. All these persons or personalities were of course "conscious" in some way, as everything is probably conscious. The question is, where do the threads of recollection run that enable us to identify the persons?

I know that Mr. Havelock Ellis and many other authors will not accept my definition, because they deny the possibility of complete recollection and free volition in a dream. They would say that what I call a dream is no dream, but a sort of trance, or hallucination, or ecstacy. The observations of the Marquis d'Herve, which were very much like mine, as related in his book, Les Reves et les moyens de les diriger, were discarded in the same way. These dreams could not be dreams, said Maury.

Now this is simply a question of nomenclature. I can only say that I made my observations during normal deep and healthy sleep, and that in 352 cases I had a full recollection of my day-life, and could act voluntarily, though I was so fast asleep that no bodily sensations penetrated into my perception. If anybody refuses to call that state of mind a dream, he may suggest some other name. For my part, it was just this form of dream, which I call "lucid dreams," which aroused my keenest interest and which I noted down most carefully.

I quite agree with Mr. Havelock Ellis, that during sleep the psychical functions enter into a condition of dissociation. My contention, however, is that it is not dissociation, but, on the contrary, reintegration, after the dissociation of sleep, that is the essential feature of dreams. The dream is a more or less complete reintegration of the psyche, a reintegration in a different sphere, in a psychical, nonspatial mode of existence. This reintegration may go so far as to effect full recollection of day-life, reflection, and voluntary action on reflection.

The third type, ordinary dreaming, is the usual well-known type to which the large majority of dreams conform; probably, it is the only kind that occurs to many people. It is not particularly pleasant or unpleasant, though it may vary according to its contents. It may occur in any moment of sleep, in daytime or in the night, and it does not need any bodily disturbance to produce it.

These dreams show dissociation, with very imperfect reintegration, and, as several authors have pointed out, they have in many respects a close likeness to insanity. The true conditions of day-life are not remembered; false remembrance--paramnesia--is very common in them; they are absurd and confused, and leave very faint traces after waking up.

The fourth type, vivid dreaming, differs from ordinary dreaming principally in its vividness and the strong impression it makes, which lasts sometimes for hours and days after waking up, with a painfully clear remembrance of every detail. These dreams are generally considered to be the effect of some abnormal bodily condition. Yet I think they must undoubtedly be distinguished from the pathological dreams. I have had them during perfectly normal bodily conditions. I do not mean to say, however, that some nervous disturbance, some psychical unrest, or some unknown influence from the waking world may not have been present. It may have been, but it escaped my observation in most cases. These vivid dreams are generally extremely absurd, or untrue, though explicit and well-remembered. The mind is entirely dissociated and reintegration is very defective.

As a rule I find dreams of this kind unpleasant because of their absurdity, their insane character, and the strong lasting impression they make. Happily they are rare, at least with me. Sometimes they leave a strong conviction that they "mean something," that they have a premonitory, a prophetic character, and when we read of instances of prophetic dreams we find generally that they belong to this type. In my case I often found that they really could "mean" nothing; sometimes, however, I was not so certain. It depends in what direction we are looking for causes. One night, when I was on a lecturing tour, I was the guest of a family in a provincial town, and slept in what I supposed to be the guest room. I had a night full of the most horrid dreams, one long confused nightmare, with a strong sentiment that it "meant something." Yet I felt in perfect health, cheerful and comfortable. I could not refrain from saying next morning at the breakfast table what an unpleasant night I had had. Then the family told me I had slept in the room of a daughter who was now in a sanatorium with a severe nervous disease, and who used to call that room her "den of torture."

It will be remarked that such vivid dreams are sometimes of a very pleasant character, filling whole days with an indescribable joy. This is true, but, according to my experience, my vividly pleasant dreams are now always of another and higher type. As a child I had these delicious vivid dreams. Now they have changed their character altogether and are of the lucid type.

In the fifth type, the symbolic or mocking dreams, the characteristic element is one which I call demoniacal. I am afraid this word will arouse some murmurs of disapproval, or at least some smiles or sneers. Yet I think I can successfully defend the use of the term. I will readily concede at once that the real existence of beings whom we may call "demons" is problematic, and yet men of science find the conception very useful and convenient.

I hope to satisfy even the most skeptical of my audience by defining the expression "demoniacal" thus:

I call demoniacal those phenomena which produce on us the impression of being invented or arranged by intelligent beings of a very low moral order.

To me it seems that the great majority of dreams reported by Freud and his adherents, and used for the building up of his elaborate theory, belong to this type.

It may indeed be called a bold deed to introduce the symbolism of dreams into the scientific world. This is Freud's great achievement.

But now let us consider what the word "symbol" implies. A symbol is an image or an imaginary event, standing for a real object or event whereto it has some distant resemblance. Now the invention of a symbol can only be an act of thought--the work of some intelligence. Symbols cannot invent themselves; they must be thought out. And the question arises: who performs this intelligent act; who thinks out the symbol? The answer given by the Freudian school is: the subconscious. But here we have one of those words which come in "wo die Begriffe fehlen." To me the word "subconscious," indicating a thinking entity, is just as mysterious, just as unscientific, just as "occult" as the word "demon." In my view it is accurate to say only that in our dreams we see images and experience events, for which our own mind--our "person" as we remember it--cannot be held responsible, and which must therefore come from some unknown source. About the general character of these sources, however, we may form some judgment and I feel justified in calling them in the dreams of this type "demoniacal"--that is of low moral order.

It is in this class also, that the erotic element, or rather the obscene element, plays such an important part. And it is no wonder that some adherents of Freud's school, studying only this kind of dream, come to the conclusion that all dreams have a sexual origin.

The sixth type, which I call general dream-sensations, is very remarkable but not easy to describe. It is not an ordinary dream; there is no vision, no image, no event, not even a word or a name. But during a long time of deep sleep, the mind is continually occupied with one person, one place, one remarkable event, or even one abstract thought. At least that is the recollection on waking up. One night I was constantly occupied by the personality of an American gentleman, in whom I am not particularly interested. I did not see him, nor hear his name, but on waking up I felt as if he had been there the whole night. In another instance it was a rather deep thought, occupying me in the deepest sleep, with a clear recollection of it after waking up. The question was: Why can a period of our life be felt as very sad, and yet be sweet and beautiful in remembrance? And the answer was: Because a human being knows only a very small part of what he is. Question and answer never left me; yet my sleep was very deep and unbroken. These dream-sensations are not unpleasant and not absurd, so long as the body is in good health.

They often have an elevating or consoling effect. In pathological dreams, however, they may be extremely strange and harassing. The sleeper may have a feeling as if he were a square or a circle, or other sensations of an utterly indescribable character.

The seventh type of dreams, which I call lucid dreams, seems to me the most interesting and worthy of the most careful observation and study. Of this type I experienced and wrote down 352 cases in the period between January 20, 1898, and December 26, 1912.

In these lucid dreams the reintegration of the psychic functions is so complete that the sleeper remembers day-life and his own condition, reaches a state of perfect awareness, and is able to direct his attention, and to attempt different acts of free volition. Yet the sleep, as I am able confidently to state, is undisturbed, deep and refreshing. I obtained my first glimpse of this lucidity during sleep in June, 1897, in the following way. I dreamt that I was floating through a landscape with bare trees, knowing that it was April, and I remarked that the perpective of the branches and twigs changed quite naturally. Then I made the reflection, during sleep, that my fancy would never be able

to invent or to make an image as intricate as the perspective movement of little twigs seen in floating by.

Many years later, in 1907, I found a passage in a work by Prof. Ernst Mach in which the same observation is made with a little difference. Like me, Mach came to the conclusion that he was dreaming, but it was because he saw the movement of the twigs to be defective, while I had wondered at the naturalness which my fancy could never invent. Professor Mach has not pursued his observations in this direction, probably because he did not believe in their importance. I made up my mind to look out carefully for another opportunity. I prepared myself for careful observation, hoping to prolong and to intensify the lucidity.

In January 1898 I was able to repeat the observation. In the night of January 19-20, I dreamt that I was lying in the garden before the windows of my study, and saw the eyes of my dog through the glass pane. I was lying on my chest and observing the dog very keenly. At the same time, however, I knew with perfect certainty that I was dreaming and lying on my back in my bed. And then I resolved to wake up slowly and carefully and observe how my sensation of lying on my chest would change into the sensation of lying on my back. And so I did, slowly and deliberately, and the transition--which I have since undergone many times--is most wonderful. It is like the feeling of slipping from one body into another, and there is distinctly a double recollection of the two bodies. I remembered what I felt in my dream, lying on my chest; but returning into the day-life, I remembered also that my physical body had been quietly lying on its back all the while. This observation of a double memory I have had many times since. It is so indubitable that it leads almost unavoidably to the conception of a dream-body.

Mr. Havelock Ellis says with something of a sneer that some people "who dabble in the occult" speak of an astral body. Yet if he had had only one of these experiences, he would feel that we can escape neither the dabbling nor the dream-body. In a lucid dream the sensation of having a body--having eyes, hands, a mouth that speaks, and so on--is perfectly distinct; yet I know at the same time that the physical body is sleeping and has quite a different position. In waking up the two sensations blend together, so to speak, and I remember as clearly the action of the dream-body as the restfulness of the physical body.

In February 1899 I had a lucid dream, in which I made the following experiment. I drew with my finger, moistened by saliva, a wet cross on the palm of my left hand, with the intention of seeing whether it would still be there after waking up. Then I dreamt that I woke up and felt the wet cross on my left hand by applying the palm to my cheek. And then a long time afterwards I woke up really and knew at once that the hand of my physical body had been lying in a closed position undisturbed on my chest all the while.

The sensation of the voice during a lucid dream is most marvellous, and after many repetitions still a source of amazement. I use my voice as loudly as I can, and though I know quite well that my physical body is lying in profound sleep, I can hardly believe that this loud voice is inaudible in the waking world. Yet, though I have sung, shouted, and spoken loudly in hundreds of dreams, my wife has never heard my voice, and in several cases was able to assure me that I had slept quite peacefully.

I cannot in this paper give even a short and superficial account of the many interesting details of these dreams. I must reserve that for my larger work. And I fear that only a repeated personal acquaintance with the facts can convince one of their significance. I will relate a few more instances in order to give some idea of their character.

On Sept. 9, 1904, I dreamt that I stood at a table before a window. On the table were different objects. I was perfectly well aware that I was dreaming and I considered what sorts of experiments I could make. I began by trying to break glass, by beating it with a stone. I put a small tablet of glass on two stones and struck it with another stone. Yet it would not break. Then I took a fine claret-glass from the table and struck it with my fist, with all my might, at the same time reflecting how dangerous it would be to do this in waking life; yet the glass remained whole. But lo! when I looked at it again after some time, it was broken.

It broke all right, but a little too late, like an actor who misses his cue. This gave me a very curious impression of being in a fake-world, cleverly imitated, but with small failures. I took the broken glass and threw it out of the window, in order to observe whether I could hear the tinkling. I heard the noise all right and I even saw two dogs run away from it quite naturally. I thought what a good imitation this comedy-world was. Then I saw a decanter with claret and tasted it, and noted with perfect clearness of mind: "Well, we can also have voluntary impressions of taste in this dream-world; this has quite the taste of wine."

There is a saying by the German poet, Novalis, that when we dream that we dream, we are near waking up. This view, shared as it is by the majority of observers, I must decidedly reject. Lucid dreams occur in deep sleep and do not as a rule end in waking up, unless I wish it and do it by an act of volition. I prefer, however, in most cases to continue dreaming as long as possible, and then the lucidity vanishes and gives place to other forms of dream, and--what seems remarkable--the form that follows is often the "demon- dream," of which I will speak presently.

Then it often happens that I dream that I wake up and tell my lucid dream to some other person. This latter is then a dream of the ordinary form. From this dream I wake up in the real waking world, very much amazed at the curious wanderings of my mind. The impression is as if I had been rising through spheres of different depths, of which the lucid dream was the deepest.

I may state that without exception all my lucid dreams occurred in the hours between five and eight in the morning. The particular significance of these hours for our dreams has often been brought forward--among others by Dante, Purg. IX., where he speaks of the hour when the swallows begin to warble and our mind is least clogged by the material body.

Lucid dreams are also symbolic--yet in quite a different way, I never remarked anything sexual or erotic in them. Their symbolism takes the form of beautiful landscapes--different luminous phenomena, sunlight, clouds, and especially a deep blue sky. In a perfect instance of the lucid dream I float through immensely wide landscapes, with a clear blue, sunny sky, and a feeling of deep bliss and gratitude, which I feel impelled to express by eloquent words of thankfulness and piety. Sometimes these words seem to me a little rhetorical, but I cannot help it, as it is very difficult in dreams to control emotional impulses. Sometimes I conceive of what appears as a symbol, warning, consoling, approving. A cloud gathers or the light brightens. Only once could I see the disc of the sun.

Flying or floating may be observed in all forms of dreams, except perhaps the class of general dream sensations; yet it is generally an indication that lucid dreams are coming.

When I have been flying in my dreams for two or three nights, then I know that a lucid dream is at hand. And the lucid dream itself is often initiated and accompanied all the time by the sensation of flying. Sometimes I feel myself floating swiftly through wide space; once I flew backwards, and once, dreaming that I was inside a cathedral, I flew upwards, with the immense building and all in it, at great speed. I cannot believe that the rhythm of our breath has anything to do with this sensation, as Havelock Ellis supposes, because it is generally continuous and very swift.

Difficult, spasmodic floating belongs to dreaming of a lower class, and this may depend on morbid conditions of the body; but it may also be symbolic of some moral difficulty or distress.

On Christmas Day 1911 I had the following dream. It began with flying and floating. I felt wonderfully light and strong. I saw immense and beautiful prospects--first a town, then country-landscapes, fantastic and brightly colored. Then I saw my brother sitting--the same who died in 1906--and I went up to him saying: "Now we are dreaming, both of us." He answered: "No, I am not!" And then I remembered that he was dead. We had a long conversation about the conditions of existence after death, and I inquired especially after the awareness, the clear, bright insight. But that he could not answer; he seemed to lack it.

Then the lucid dream was interrupted by an ordinary dream in which I saw a lady standing on a bridge, who told me she had heard me talk in my sleep. And I supposed that my voice had been audible during the lucid dream.

Then a second period of lucidity followed in which I saw Prof. van't Hoff, the famous Dutch chemist, whom I had known as a student, standing in a sort of college-room, surrounded by a number of learned people. I went up to him, knowing very well that he was dead, and continued my inquiry about our condition after death. It was a long, quiet conversation, in which I was perfectly aware of the situation.

I asked first why we, lacking our organs of sense, could arrive at any certainty that the person to whom we were talking was really that person and not a subjective illusion. Then van't Hoff said: "Just as in common life; by a general impression."

"Yet," I said, "in common life there is stability of observation and there is consolidation by repeated observation."

"Here also," said van't Hoff. "And the sensation of certainty is the same." Then I had indeed a very strong feeling of certitude that it was really van't Hoff with whom I talked and no subjective illusion. Then I began to inquire again about the clearness, the lucidity, the stability of this life of shades and then I got the same hesitating, dubious, unsatisfactory answer as from my brother. The whole atmosphere of the dream was happy, bright, elevated, and the persons around van't Hoff seemed sympathetic, though I did not know them.

"It will be some time probably before I join you," I said. But I took myself then for younger than I was.

After that I had several ordinary dreams and I awoke quite refreshed, knowing my voice had not been audible in the waking world.

In May 1903 I dreamed that I was in a little provincial Dutch town and at once encountered my brother-in-law, who had died some time before. I was absolutely sure that it was he, and I knew that he was dead. He told me that he had much intercourse with my "controller," as he expressed it--my guiding spirit. I was glad, and our conversation was very cordial, more intimate than ever in common life. He told me that a financial catastrophe was impending for me. Somebody was going to rob me of a sum of 10,000 guilders. I said that I understood him, though after waking up I was utterly puzzled by it and could make nothing of it. My brother-in-law said that my guiding spirit had told it to him. I told the story to somebody else in my dream. Then I asked my brother-in-law to tell me more of the after-life, and just as he was going to answer me I woke up--as if somebody cut off the communication. I was not then as much used to prolonging my dreams as I am now.

I wish to point out that this was the only prediction I ever received in a lucid dream in such an impressive way. And it came only too true, with this difference, that the sum I lost was twenty times greater. At the time of the dream there seemed not to be the slightest probability of such a catastrophe. I was not even in possession of the money I lost afterwards. Yet it was just the time when the first events took place--the railway strikes of 1903--that led up to my financial ruin.

There may be deceit in the lucid dream. In March 1912 I had a very complicated dream, in which I dreamt that Theodore Roosevelt was dead, then that I woke up and told the dream, saying: "I was not sure in my dream whether he was really dead or still alive; now I know that he is really dead; but I was so struck by the news that I lost my memory." And then came a false lucidity in which I said: "Now I know that I dream and where I am." But this was all wrong; I had no idea of my real condition, and only slowly, after waking up, I realized that it was all nonsense.

This sort of mockery I call demoniacal. And there is a connection, which I observed so frequently that it must have some significance--namely that a lucid dream is immediately followed by an eighth type of dream I call a demon-dream.

I hope you allow me, if only for convenience sake, to speak as if these intelligences of a low moral order exist. Let me call it also a working hypothesis. Then I wish to point out to you the difference between the symbolic or mocking dreams described earlier and the demon-dreams.

In the symbolic dreams the sleeper is teased or puzzled or harassed by various more or less weird, uncanny, obscene, lugubrious or diabolical inventions. He has to walk in slaughter-houses or among corpses; he finds everything besmeared with blood or excrement; he is drawn into obscene, erotic or horrible scenes, in which he even takes an active part. His moral condition is utterly depraved; he is a murderer, an adulterer, etc.; in a word, nothing is too low or too horrible for such dream.

After waking up the effect is, of course, unpleasant; he is more or less ashamed and shocked; he tries to shake off the memory as soon as possible.

Now in the demon-dreams--which are always very near, before or after, the lucid dreams--I undergo similar attacks; but I see the forms, the figures, the personalities of strange non-human beings, who are doing it. One night, for instance, I saw such a being, going before me and soiling everything he touched, such as door-handles and chairs. These beings are always obscene and lascivious, and try to draw me into their acts and doings. They have no sex and appear alternately as a man, or a woman. Their aspect is very various and variable, changing every moment, taking all the fantastic forms that the old painters of the Middle Ages tried to reproduce, but with a certain weird plasticity and variability, that no painting can express.

I will describe one instance of these dreams (March 30, 1907, in Berlin), following immediately after a lucid dream. The lucidity had not been very intense, and I had some doubts about my real condition. Then all at once I was in the middle of demons. Never before had I seen them so distinct, so impertinent, so aggressive. One was slippery, shining, limp and cold, like a living corpse. Another changed its face repeatedly and made the most incredible grimaces. One flew underneath me shouting an obscenity with a curious slang-word. I defended myself energetically, but principally with invectives, which I felt to be a weakness. I saw the words written.

The circle of demons was close to me and grinning like a mob of brutal street- boys. I was not afraid, however, and said: "Even if you conquer me, if God wills it I do not fear." Then they all cried together like a rabble, and one said: "Let God then speak first!" And then I thundered with all my

might: "He HAS spoken long since!" And then I pointed at one of them, saying: "You I know for a long time!" and then pointing to another: "And you!"

Then I awoke at once, and I believe I made some audible sound in waking up in the middle of my apostrophe.

And then--this will astonish you most--after this dispute I felt thoroughly refreshed, cheered up and entirely serene and calm.

This is the principal difference from the symbolic dreams that in the demon- dreams when I see the demons and fight them, the effect is thoroughly pleasing, refreshing and uplifting.

This is the principal point in these demon-dreams--that, whether these beings have a real existence or whether they are only creations of my fancy, to see them and to fight them takes away all their terror, all the uncanniness, the weirdness, of their tricks and pranks.

I have not yet spoken about the ninth dream type, which I call wrong waking up, occurring always near awakening. Of this sort of dream I found an excellent instance described by Mach. He calls it "Phantasma." We have the sensation of waking up in our ordinary sleeping-room and then we begin to realize that there is something uncanny around us; we see inexplicable movements or hear strange noises, and then we know that we are still asleep. In my first experience of this dream I was rather afraid and wanted nervously to wake up really. I think this is the case with most people who have it. They become frightened and nervous and at last wake up with palpitations, a sweating brow and so on.

To me now these wrong-waking-up-dreams have lost their terror. I consider them as demon-pranks, and they amuse me; they do not tell on my nerves any more.

In July 1906 sleeping at Langen Schwalbach a deep sleep after a laborious day, I had two or three dreams of this type. I seemed to wake up and heard a big luggage-box being blown along the landing, with tremendous bumping. Then I realized that I had awakened in the demon-sphere. The second time I saw that my sleeping-room had three windows, though I knew there were only two. Wishing to make sure, I woke up for a moment voluntarily and realized that my room had two windows and that stillness had reigned in the house all night.

After that I had a succession of lucid dreams, very beautiful. At the end of them, while I was still singing loudly, I was suddenly surrounded by many demons, who joined in my singing, like a mob of vicious semi-savage creatures. Then I felt that I was losing my self-control. I began to act more and more extravagantly, to throw my bedclothes and my pillows about, and so on. I drew myself up and saw one demon who had a less vicious look than the others and he looked as if he were saying "you are going wrong." "Yes," I said, "but what shall I do?" Then he said, "Give them the whip, on their naked backs." And I thought of Dante's shades, who also feared the whip. I at once made--created --a whip of leathern strings, with leaden balls at the end. And I threatened them with it and also struck at them a few times. Then suddenly all grew perfectly quiet around me, and I saw the creatures sneaking away with hypocritical faces, as if they knew nothing about it at all.

I had many more adventures that night, lucid and ordinary dreams, and I awoke fresh and cheerful, better in spirits than I had been for a long time.

This wrong-waking-up type is not to be confused with the dreams in which I dreamt that I woke after a lucid dream and told that dream to some listener. Those dreams were of the ordinary sort.

There was nothing uncanny about them. Dreams of the wrong-waking-up class are undoubtedly demoniacal, uncanny, and very vivid and bright, with a sort of ominous sharpness and clearness, a strong diabolical light. Moreover the mind of the sleeper is aware that it is a dream, and a bad one, and he struggles to wake up. As I said just now, however, the terror ends as soon as the demons are seen--as soon as the sleeper realizes he must be the dupe of intelligences of a low moral order. I am prepared to hear myself accused of superstition, of reviving the dark errors of the Middle Ages. Well, I only try to tell the facts as clearly as possible and I cannot do it without using these terms and ideas. If anybody will replace them by others, I am open to any suggestion. Only I would maintain that it is not my mind that is responsible for all the horrors and errors of dream-life. To say that nobody is responsible for them will not do, for there is absolute evidence in them of some thought and intention, however depraved and low. A trick, a deceit, a symbol, cannot be without some sort of thought and intention. To put it all down to "unconsciousness" is very convenient; but then I say that it is just as scientific to use the names Beelzebub, or Belial. I, for one, do not believe in "unconsciousness" any more than in Santa Claus.

The remark may be made that in introducing intelligent beings of a low order to explain these phenomena, an element of arbitrariness is brought in, which excludes the possibility of finding a scientific order. It is, for instance, convenient to ascribe all the phenomena of insanity and of pathological dreams to demons, who make use of the weakness of the body to play their tricks. This is, in fact, the opinion of no less a man than Alfred Russel Wallace, as he freely confessed to me in a personal conversation.

I do not think, however, that even this idea, taken as a working hypothesis, will prevent us from trying to find a scientific order even in these apparently demoniacal tricks; the fact, for instance, that certain drugs bring about hallucinations of a well-defined kind; that cocaine produces delicious expectations and pleasant dreams, and alcohol causes visions of small white animals. This suggests that there must be some order behind it, which is not purely arbitrary.

We are here, however, on the borders of a realm of mystery where we have to advance very carefully. To deny may be just as dangerous and misleading as to accept.

From Proceedings of the Society for Psychical Research, Vol. 26, 1913 copied and proofread by Blake Wilfong (blake@phoenix.net).

Comments by Blake Wilfong: In this seminal work, van Eeden describes several varieties of dreams and coins the phrase "lucid dream". Although many of his conclusions contradict the findings of modern researchers, this paper remains a classic.

The Lucidity Institute Answers Frequently Asked Questions About Lucid Dreaming [version 2.3, July 16, 2004]

Lucid Dreaming FAQ

This FAQ is a brief introduction to lucid dreaming--what it is, how to do it, and what can be done with it. There are several excellent sources of information on lucid dreaming, the most reliable and extensive of which is the Lucidity Institute website (http://www.lucidity.com). Other sources are listed below. Suggestions for additions to or modifications of this FAQ should be directed to suggestions.

If you would like to receive occasional updates on lucid dreaming research, events, and news via email, please join the Lucidity Institute Mailing List..

1 WHAT IS LUCID DREAMING?

Lucid dreaming means dreaming while knowing that you are dreaming. The term was coined by Frederik van Eeden who used the word "lucid" in the sense of mental clarity. Lucidity usually begins in the midst of a dream when the dreamer realizes that the experience is not occurring in physical reality, but is a dream. Often this realization is triggered by the dreamer noticing some impossible or unlikely occurrence in the dream, such as flying or meeting the deceased. Sometimes people become lucid without noticing any particular clue in the dream; they just suddenly realize they are in a dream. A minority of lucid dreams (according to the research of LaBerge and colleagues, about 10 percent) are the result of returning to REM (dreaming) sleep directly from an awakening with unbroken reflective consciousness.

The basic definition of lucid dreaming requires nothing more than becoming aware that you are dreaming. However, the quality of lucidity can vary greatly. When lucidity is at a high level, you are aware that everything experienced in the dream is occurring in your mind, that there is no real danger, and that you are asleep in bed and will awaken shortly. With low-level lucidity you may be aware to a certain extent that you are dreaming, perhaps enough to fly or alter what you are doing, but not enough to realize that the people are dream representations, or that you can suffer no physical damage, or that you are actually in bed.

1.2 IS LUCID DREAMING THE SAME AS DREAM CONTROL?

Lucidity is not synonymous with dream control. It is possible to be lucid and have little control over dream content, and conversely, to have a great deal of control without being explicitly aware that you are dreaming. However, becoming lucid in a dream is likely to increase the extent to which you can deliberately influence the course of events. Once lucid, dreamers usually choose to do something permitted only by the extraordinary freedom of the dream state, such as flying.

You always have the choice of how much control you want to exert. For example, you could continue with whatever you were doing when you became lucid, with the added knowledge that you are dreaming. Or you could try to change everything--the dream scene, yourself, other dream characters. It is not always possible to perform "magic" in dreams, like changing one object into another or transforming scenes. A dreamer's ability to succeed at this seems to depend a lot on the dreamer's confidence. As Henry Ford said, "Believe you can, believe you can't; either way, you're right." On the other hand, it appears there are some constraints on dream control that may be in-

dependent of belief. See "Testing the Limits of Dream Control: The Light and Mirror Experiment" for more on this.

1.3 HOW ARE LUCID DREAMS RELATED TO OUT-OF-BODY EXPERIENCES (OBEs)?

A mysterious and highly controversial phenomenon sometimes occurs in which people experience the compelling sensation that they have somehow "left their bodies." The "out-of-body experience" or "OBE", as this fascinating phenomenon is usually termed, takes a variety of forms. In the most typical, you are lying in bed, apparently awake, when suddenly you experience a range of primarily somatic sensations, often including vibrations, heaviness, and paralysis. Then you experience the vivid sensation of separating from your "physical body" in what feels like a second body, often floating above the bed.

It is important to note the distinction between the phenomenal reality of the OBE and the various interpretations of the experience. What is really happening when you feel yourself "leaving your body"? According to one school of thought, what is actually happening is just what it feels like: you are moving in a second body out of and away from your physical body--in physical space. But this "explanation" doesn't hold up very well under examination. After all, the body we ordinarily feel ourselves to be (or if you like, to inhabit) is a phenomenal or mental body rather than a physical body. The space we see around us is not physical space as "common sense" tells us, but as modern psychology makes clear, a phenomenal or mental space. In general, our consciousness is a mental model of the world.

OBE enthusiasts promote lucid dreaming as a "stepping stone" to the OBE. Conversely, many lucid dreamers have had the experience of feeling themselves "leave the body" at the onset of a lucid dream. From a laboratory study, we have concluded that OBEs can occur in the same physiological state as lucid dreams. Wake-initiated lucid dreams (WILDs) were three times more likely to be labeled "OBEs" than dream initiated lucid dreams. If you believe yourself to have been awake, then you are more likely to take the experience at face value and believe yourself to have literally left your physical body in some sort of mental or "astral" body floating around in the "real" physical world. If, on the other hand, you think of the experience as a dream, then you are likely to identify the OBE body as a dream body image and the environment of the experience as a dream world. The validity of the latter interpretation is supported by observations and research on these phenomena.

2.1 WHY HAVE LUCID DREAMS?

Upon hearing about lucid dreaming for the first time, people often ask, "Why should I want to have lucid dreams? What are they good for?" If you consider that once you know you are dreaming, you are restricted only by your ability to imagine and conceive, not by laws of physics or society, then the answer to what lucid dreaming is good for is either extremely simple (anything!) or extraordinarily complex (everything!). It is easier to provide a sample of what some people have done with lucid dreaming than to give a definitive answer of its potential uses.

2.1.1 Adventure and Fantasy

Often, the first thing that attracts people to lucid dreaming is the potential for wild adventure and fantasy fulfillment. Flying is a favorite lucid dream delight, as is sex. Many people have said that their first lucid dream was the most wonderful experience of their lives. A large part of the extraordi-

nary pleasure of lucid dreaming comes from the exhilarating feeling of utter freedom that accompanies the realization that you are in a dream and there will be no social or physical consequences of your actions. One might think that this is a rather intellectual concept, but an ecstatic "rush" frequently arises with the first realization that one is dreaming.

2.1.2 Overcoming Nightmares

Unfortunately for many people, instead of providing an outlet for unlimited fantasy and delight, dreams can be dreaded episodes of limitless terror. As is discussed in the books Lucid Dreaming (LaBerge, 1985) and Exploring the World of Lucid Dreaming (EWLD) (LaBerge & Rheingold, 1990), lucid dreaming may well be the basis of the most effective therapy for nightmares. If you know you are dreaming, it is a simple logical step to realizing that nothing in your current experience, however unpleasant, can cause you physical harm. There is no need to run from or fight with dream monsters. In fact, it is often pointless to try, because the horror pursuing you was conceived in your own mind, and as long as you continue to fear it, it can pursue you wherever you dream yourself to be. The only way to really "escape" is to end your fear. (For a discussion of reasons for recurrent nightmares, see Overcoming Nightmares from EWLD.) The fear you feel in a nightmare is completely real; it is the danger that is not.

Unreasonable fear can be defused by facing up to the source, or going through with the frightening activity, so that you observe that no harm comes to you. In a nightmare, this act of courage can take any form that involves facing the "threat" rather than avoiding it. For example, one young man dreamt of being pursued by a lion. When he had no place left to run, he realized he was dreaming and called to the lion to "come and get him." The challenge turned into a playful wrestling match, and the lion became a sexy woman (NightLight 1.4, 1989, p. 13). Monsters often transform into benign creatures, friends, or empty shells when courageously confronted in lucid dreams. This is an extremely empowering experience. It teaches you in a very visceral manner that you can conquer fear and thereby become stronger.

2.1.3 Rehearsal

Lucid dreaming is an extraordinarily vivid form of mental imagery, so realistic that the trick is to realize it is a mental construct. It is no surprise, therefore, that many people use lucid dreaming to rehearse for success in waking life. Examples of such applications include public speaking, difficult confrontations, artistic performance and athletic prowess. Because the activity of the brain during a dreamed activity is the same as during the real event, neuronal patterns of activation required for a skill (like a ski jump or pirouette) can be established in the dream state in preparation for performance in the waking world. See EWLD for examples.

2.1.4 Creativity and Problem Solving

The creative potential of dreams is legendary. The brain is highly active in REM sleep and unconstrained by sensory input, which together may contribute to the novel combinations of events and objects we experience as dream bizarreness. This same novelty allows thought to take on forms that are rare in waking life, manifesting as enhanced creativity, or defective thinking depending on one's point of view (As Roland Fisher put it, "One man's creativity is another's brain damage."). The claim of enhanced creativity of the dream state is supported by LI research: One study found word associations immediately after awakening from a dream to be 29% more likely to be uncommon compared to word associations later in the day (NightLight, 6.4, 1994). Another study comparing a variety of kinds of experience including daydreams, memories of actual events, and dreams, found that dreams were judged as being significantly more creative than both daydreams and memories

(NL, 4.1, 1992). In any case, many lucid dreamers report using dreams for problem solving and artistic inspiration; see EWLD for a variety of examples.

2.1.5 Healing

The effects of visual imagery on the body are well-established. Just as skill practice in a dream can enhance waking performance, healing dream imagery may improve physical health. Medical patients have often used soothing and positive imagery to alleviate pain, and the dream world offers the most vivid form of imagery. Thus, some people have use lucid dreams in overcoming phobias, working with grief, decreasing social and sexual anxieties, achieving greater self-confidence and by directing the body image in the dream to facilitate physical healing. The applications, which are described in greater detail in EWLD, deserve clinical study, as they may be the greatest boon that lucid dreaming has to offer. Other potential healing applications of lucid dreaming include: practice of physical skills by stroke and spinal cord injury patients to encourage recovery of neuromuscular function, enjoyment of sexual satisfaction by people with lower body sensory loss (fully satisfying dream sex requires only mental stimulation!), more rapid recovery from injury or disease through the use of lucid dream imagery, and an increased sense of freedom for anyone who feels limited by disability or circumstance.

2.1.6 Transcendence

The experience of being in a lucid dream clearly demonstrates the astonishing fact that the world we see is a construct of our minds. This concept, so elusive when sought in waking life, is the cornerstone of spiritual teachings. It forces us to look beyond everyday experience and ask, "If this is not real, what is?" Lucid dreaming, by so baldly baring a truth that many spend lives seeking, often triggers spiritual questioning in people who try it for far more mundane purposes. Not only does lucid dreaming lead to questioning the nature of reality, but for many it also has been a source of transcendent experience. Exalted and ecstatic states are common in lucid dreams. EWLD presents several cases of individuals achieving states of union with the Highest, great peace and a new sense of their roles in life.

2.2 CAN LUCID DREAMING BE DANGEROUS?

The overwhelming majority of lucid dreams are positive, rewarding experiences. Moreover, lucidity in unpleasant dreams or nightmares can transform habitual fear into conscious courage. The simple state of lucidity is frequently enough to elevate the mood of a dreamer in a nightmare. In a study of the effect of lucid dreams on mood, college students reported that realizing they were dreaming in a nightmare helped them feel better about 60 percent of the time. Lucidity was seven times more likely to make nightmares better than worse.

A parallel concern is that dying in a dream can cause death in reality. If this were true, how would we know? Anyone who died from a dream could not tell us about its content. Many people, after awakening alive, report having died in their dreams with no ill effect. Dreams of death can actually be insightful experiences about life, rebirth, and transcendence.

Some people believe that dreams are messages from the unconscious mind and should not be consciously altered. Modern research on dreaming, discussed further in chapter 5 of EWLD, suggests that dreams are not messages, but models of the world. While awake, sensory and perceptual information governs our model. While dreaming, our bodies are paralyzed and our brain builds a world model based on a secondary source; namely, our assumptions, motivations, and expectations.

These biases are difficult to identify while awake, so a world based entirely on such biases, the world of dreams, can help us to recognize them. Thus, dreams are not messages, but are more like clues into the inner workings of our minds. The conscious and critical awareness that accompanies lucid dreams allows dreamers to thoughtfully interpret their dreams while they happen.

Finally, some people worry that lucid dreams are so exciting and pleasurable that they will become addicted and "sleep their life away." There is a biological obstacle to living in lucid dreams: we have a limited amount of REM sleep. More importantly, lucid dreams can be inspirations for how to act and improve in reality. Your behavior strongly influences your experience in both worlds. Lucid dreams can be signposts for how you can make your waking reality more exciting and enjoyable.

3.1 CAN EVERYONE LEARN TO HAVE LUCID DREAMS?

Lucid dreaming is a skill you can develop, like learning a new language. A few individuals may have an innate talent for achieving lucidity, yet even they can benefit from instruction and practice in making the most of their lucid dreams. Many more people experience lucidity as a rare spontaneous event, but need training to enjoy lucid dreams at will. The best predictor of success with lucid dreaming is the ability to remember dreams. This, too, is a skill you can develop. With specific techniques, you can increase the quantity and quality of your dream recall, which will in turn greatly increase your ability to have lucid dreams.

3.2 HOW DO I LEARN TO HAVE LUCID DREAMS?

The two essentials to learning lucid dreaming are motivation and effort. Although most people report occasional spontaneous lucid dreams, they rarely occur without our intending it. Lucid dream induction techniques help focus intention and prepare a critical mind. They range from millennium-old Tibetan exercises to modern methods developed by dream researchers. Try the following techniques and feel free to use personal variants. Experiment, observe, and persevere - lucid dreaming is easier than you may think.

3.2.1 Dream Recall

The most important prerequisite for learning lucid dreaming is excellent dream recall. There are two likely reasons for this. First, when you remember your dreams well, you can become familiar with their features and patterns. This helps you to recognize them as dreams while they are still happening. Second, it is possible that with poor dream recall, you may actually have lucid dreams that you do not remember!

The procedure for improving your dream recall is fully detailed in EWLD and A Course in Lucid Dreaming in addition to many other books on dreams. A brief discussion of the methods involved is available on the Lucidity Institute web site. The core exercise is writing down everything you recall about your dreams in a dream journal immediately after waking from the dream, no matter how fragmentary your recall. Record what you recall immediately upon waking from the dream; if you wait until morning you are likely to forget most, if not all, of the dream. In A Course in Lucid Dreaming we advise that people build their dream recall to at least one dream recalled per night before proceeding with lucid dream induction techniques.

3.2.2 Reality Testing

This is a good technique for beginners. Assign yourself several times a day to perform the following exercise. Also do it anytime you think of it, especially when something odd occurs or when you are reminded of dreams. It helps to choose specific occasions like: when you see your face in the mirror, look at your watch, arrive at work or home, pick up your NovaDreamer, etc. The more frequently and thoroughly you practice this technique, the better it will work.

1. Do a reality test.

Carry some text with you or wear a digital watch throughout the day. To do a reality test, read the words or the numbers on the watch. Then, look away and look back, observing the letters or numbers to see if they change. Try to make them change while watching them. Research shows that text changes 75% of the time it is re-read once and changes 95% it is re-read twice. If the characters do change, or are not normal, or do not make sense, then you are most probably dreaming. Enjoy! If the characters are normal, stable, and sensible, then you probably aren't dreaming. Go on to step 2.

2. Imagine that your surroundings are a dream.

If you are fairly certain you are awake (you can never be 100% sure!), then say to yourself, "I may not be dreaming now, but if I were, what would it be like?" Visualize as vividly as possible that you are dreaming. Intently imagine that what you are seeing, hearing, smelling, feeling is all a dream. Imagine instabilities in your environment, words changing, scenes transforming, perhaps you floating off the ground. Create in yourself the feeling that you are in a dream. Holding that feeling, go on to step 3.

3. Visualize yourself enjoying a dream activity.

Decide on something you would like to do in your next lucid dream, perhaps flying, talking to particular dream characters, or just exploring the dream world. Continue to imagine that you are dreaming now, and visualize yourself enjoying your chosen activity.

3.2.3 Dreamsigns

Another dream-recall related exercise introduced in EWLD and further developed in A Course in Lucid Dreaming is identifying "dreamsigns." This term, coined by LaBerge, refers to elements of dreams that indicate that you are dreaming. (Examples: miraculous flight, purple cats, malfunctioning devices, and meeting deceased people.) By studying your dreams you can become familiar with your own personal dreamsigns and set your mind to recognize them and become lucid in future dreams. The Course also provides exercises for noticing dreamsigns while you are awake, so that the skill carries over into your dreams. This exercise also applies to lucid dream induction devices, which give sensory cues--special, artificially-produced dreamsigns--while you are dreaming. To succeed at recognizing these cues in dreams, you need to practice looking for them and recognizing them while you are awake.

3.2.4 Mnemonic Induction of Lucid Dreams (MILD)

The MILD technique employs prospective memory, remembering to do something (notice you're dreaming) in the future. Dr. LaBerge developed this technique for his doctoral dissertation and used it to achieve lucid dreaming at will. The proper time to practice MILD is after awakening from a dream, before returning to sleep. (Modified from EWLD, p. 78)

1. Setup dream recall.

Set your mind to awaken from dreams and recall them. When you awaken from a dream, recall it as completely as you can.

2. Focus your intent.

While returning to sleep, concentrate single-mindedly on your intention to remember to recognize that you're dreaming. Tell yourself: "Next time I'm dreaming, I will remember I'm dreaming," repeatedly, like a mantra. Put real meaning into the words and focus on this idea alone. If you find yourself thinking about anything else, let it go and bring your mind back to your intention.

3. See yourself becoming lucid.

As you continue to focus on your intention to remember when you're dreaming, imagine that you are back in the dream from which you just awakened (or another one you have had recently if you didn't remember a dream on awakening). Imagine that this time you recognize that you are dreaming. Look for a dreamsign--something in the dream that demonstrates plainly that it is a dream. When you see it say to yourself: "I'm dreaming!" and continue your fantasy. Imagine yourself carrying out your plans for your next lucid dream. For example, if you want to fly in your lucid dream, imagine yourself flying after you come to the point in your fantasy when you become lucid.

4. Repeat until your intention is set.

Repeat steps 2 and 3 until either you fall asleep or are sure that your intention is set. If, while falling asleep, you find yourself thinking of anything else, repeat the procedure so that the last thing in your mind before falling asleep is your intention to remember to recognize the next time you are dreaming.

3.2.5 Napping

Two observations led LaBerge in the late 1970s to develop morning napping as a method of lucid dream induction. First, he noticed that lucidity seemed to come easier in afternoon naps. The second suggestion same from several lucid dreamers who noted that certain activities during the night appeared to induce lucid dreaming. The diverse qualities of these interruptions: sex, vomiting, and pure meditation, piqued LaBerge's curiosity regarding what feature each might possess conducive to lucidity. The answer proved to be quite simple: wakefulness interjected during sleep increases the likelihood of lucidity. In fact, the nap technique, refined through several NightLight experiments, is an extremely powerful method of stimulating lucid dreams. The technique requires you to awaken one hour earlier than usual, stay awake for 30 to 60 minutes, then go back to sleep. One study showed a 15 to 20 times increased likelihood of lucid dreaming for those practicing the nap technique over no technique. During the wakeful period, read about lucid dreaming, practice reality checks and then do MILD as you are falling asleep. The Lucidity Institute's training programs include this technique as an essential part of the schedule, one of the reasons why most participants have lucid dreams during the session.

3.3 HOW QUICKLY CAN I LEARN LUCID DREAMING?

The speed with which you develop the skill of lucid dreaming depends on many individual factors. How well do you recall dreams? How much time can you give to practicing mental exercises? Do you use a lucid dream induction device? Do you practice diligently? Do you have a well developed critical thinking faculty? And so on.

Case histories may provide a more tangible picture of the process of learning lucid dreaming. Dr. LaBerge increased his frequency of lucid dreaming from about one per month to up to four a night (at which point he could have lucid dreams at will) over the course of three years. He was studying lucid dreaming for his doctoral dissertation and therefore needed to learn to have them on demand as quickly as possible. On the other hand, he had to invent techniques for improving lucid

dreaming skills. Thus, people starting now, although they may not be as strongly motivated as LaBerge or have the same quantity of time to devote to it, have the advantage of the tested techniques, training programs, and electronic biofeedback aids that have been created in the two decades since LaBerge began his studies.

Lynne Levitan, staff writer for the Lucidity Institute, describes her experiences with learning lucid dreaming as follows:

"I first heard of lucid dreaming in April of 1982, when I took a course from Dr. LaBerge at Stanford University. I had had the experience many years before and was very interested to learn to do it again, as well as to get involved in the research. First I had to develop my dream recall, because at the time I only remembered two or three dreams per week. In a couple of months I was recalling 3 to 4 or more per night, and in July (about three months after starting) I had my first lucid dream since adolescence. I worked at it on and off for the next four years (not sleeping much as a student) and reached the level of 3 to 4 lucid dreams per week. Along the way, I tested several prototypes of the DreamLight lucid dream induction device and they clearly helped me to become more proficient at realizing when I was dreaming. During the first two years that we were developing the DreamLight, I had lucid dreams on half of the nights I used one of these devices, compared to once a week or less without. In considering how long it took me to get really good at lucid dreaming, note that I did not have the benefit of the thoroughly studied and explained techniques now available either, because the research had not yet been done nor the material written. Therefore, people now should be able to accomplish the same learning in far less time given, of course, sufficient motivation."

3.4 WHAT TECHNOLOGY IS AVAILABLE TO ASSIST LUCID DREAMING TRAINING?

The Lucidity Institute offers electronic devices that help people have lucid dreams. They were developed through laboratory research at Stanford University by LaBerge, Levitan, and others. The basic principle behind these devices is as follows: the primary task confronting someone who wishes to have a lucid dream is to remember that intention while in a dream. One of the best ways to increase a person's chances of having a lucid dream is to give a reminder to the person during REM sleep. In the lab, we found that flashing light cues worked well in that they tended to incorporate into ongoing dreams without causing awakening. You may have noticed that occasional bits of sensory information are filtered into your dreams in disguised form, like a clock radio as supermarket music or a chain saw as the sound of a thunderstorm. This is the same principle used by our lucid dream induction devices: the lights or sounds from the device filter into the user's dreams. In cases of very deep sleepers, we found that it was sometimes necessary to use sound as well as light to get the cues into dreams. The dreamer's task is to notice the flashing lights in the dream and remember that they are cues to become lucid. Because we could not possibly accommodate everyone who wants to come into the sleep lab for a lucid dream induction session and most people would rather sleep at home anyway, we worked for several years to develop a comfortable, portable device that would detect REM sleep and deliver a cue tailored to the individual user's needs.

3.4.1 The NovaDreamer

The NovaDreamer lucid dream induction device works by giving flashing light or sound cues when the user is dreaming. Users modify the device settings to find a cue with the right intensity and length to enter their dreams without causing awakening. In addition, device users practice mental

exercises while awake to enhance their ability to recognize the light cues when they appear in dreams. The NovaDreamer includes a soft, comfortable sleep mask, which contains the flashing lights, a speaker, and an eye movement detection apparatus. The NovaDreamer's electronics are all inside the sleep mask. The NovaDreamer uses REM detection to time the delivery of lucidity cue and provides feedback on the number of cues given. It includes the "Dream Alarm" feature to boost dream recall. Users have a choice of a wide selection of cues and receive feedback on the number of cues they receive during a sleep period.

The lucidity cues of the NovaDreamer are intended to enter into ongoing dreams. This can occur in several ways. Cues can be superimposed over the dream scene, like a light flashing in one's face, or they can briefly interrupt the dream scene. The most common (and most difficult to identify) incorporation of cues is into dream stories. Little brother flashing the room lights, flash bulbs, lightning, traffic signals, police car lights: all are real examples of incorporations of NovaDreamer cues. The trickiness of cue appearances underscores the need to thoroughly prepare one's mind to recognize cues via waking practice.

The NovaDreamer offers a second method of lucid dream stimulation. This method arose out of the discovery that while sleeping with the NovaDreamer, people frequently dreamed that they awakened wearing the device, and pressed the button on the front of the mask to start the "delay," a feature that disables cues while you are drifting off to sleep. Ordinarily, a button press would cause a beep to tell you that you had successfully pressed it. However, people were reporting that the button was not working in the middle of the night. Actually, they were dreaming that they were awakening and pressing the button, and the button did not work because it was a dream version of the NovaDreamer. Dream versions of devices are notorious for not working normally. Once people were advised that failure of the button in the middle of the night was a sign that they were probably dreaming, they were able to use this "dreamsign" reliably to become lucid during "false awakenings" with the NovaDreamer. Research suggests that about half of the lucid dreams stimulated by the devices result from using the button for reality tests. Available from the LI. For details, see the NovaDreamer manual (in html format), or in Acrobat PDF format.

3.5 HOW WELL DO LUCID DREAM INDUCTION DEVICES WORK?

The Lucidity Institute's lucid dream induction devices are designed to help people achieve lucidity by giving them cues while they are dreaming and also by providing a reliable means of testing one's state of consciousness. They do not make people have lucid dreams any more than exercise machines make people develop strong muscles. In both cases the goal, strength or lucid dreams, results from practice. The machines accelerate the process. Several factors enter into success with one of these devices. One is how accurately the cues are coordinated with the user's REM sleep. The devices' REM detection systems are adjustable to individual variables. Another success factor is how well the cues enter into the dream without awakening the sleeper. A third factor is how prepared the user is for recognizing cues in dreams and becoming lucid. Finally, the user's commitment to performing a reality test on each awakening with the device influences success. All four of these factors are, to some extent, controllable by the device user: adjustment of eye movement sensitivity to catch REM sleep, selecting a cue that enters dreams without causing awakenings, mental preparation to recognize cues in dreams, and resolution to do reality tests. Therefore, it is difficult to obtain a truly accurate measurement of the effectiveness of the devices. Nonetheless, research with various versions of the DreamLight (previous lucid dream induction device that is no longer in production) have shown that it definitely helps people have more frequent lucid dreams.

Because expectation makes lucid dreaming more likely, one might wonder whether the DreamLight is any more effective than a placebo. A study recently published in Dreaming proved that it is. In brief, fourteen experienced DreamLight users were exposed to two conditions: light cues or no light cues. Subjects thought they were testing two different light cues and did not know their nightly condition (making motivation and expectations constant). Thus, the study examined how much the DreamLight's light cues specifically contributed to the achievement of lucid dreams. More people had lucid dreams on nights when they received light cues (73% versus 27%). Lucid dream frequency was three times greater on nights with cues (one lucid dream every three nights versus one in eleven nights without cues).

An earlier study with a different version of the DreamLight showed a five-fold increase in lucid dreaming frequency when people used the Mnemonic Induction of Lucid Dreaming (MILD) mental technique in conjunction with the device, compared with using no device and no mental technique. Using the device without mental techniques worked about as well as just using the mental technique; both cases were an improvement over using nothing.

In summary, at this stage the lucid dream induction devices can definitely help people to have lucid dreams, or to have more of them. Important factors contributing to success are good dream recall (the DreamLight and NovaDreamer also can be used to boost dream recall with the "Dream Alarm feature"), diligent mental preparation, and careful adjustment of the device to meet individual needs for cueing and REM detection. No device yet exists that will make a person have a lucid dream.

3.6 ARE THERE ANY DRUGS OR NUTRITIONAL SUPPLEMENTS THAT STIMULATE LUCID DREAMS?

A number of substances have been suggested to enhance the likelihood of lucid dreaming, from vitamins to prescription drugs. There are few good scientific studies to test such claims. Lucid dreaming is highly subject to the placebo effect; the belief that something will stimulate a lucid dream is very effective! This is not to say that there are not substances that do, in fact, promote lucid dreaming. We are interested in discovering such and welcome observations from fellow dreamers. At this time, however, we do not endorse any substances for inducing lucid dreams. Many prescription drugs as well as marijuana and alcohol alter the sleep cycle, usually by suppressing REM sleep. This leads to a phenomenon called "REM rebound," in which a person experiences intense, long REM periods after the drug has worn off. This can manifest as nightmares or, possibly, as lucid dreaming, since the brain is highly active. Drugs in the LSD family, including psilocybin and tryptamines actually stimulate REM sleep (in doses small enough to allow sleep), leading to longer REM periods. We do not recommend the use of drugs without proper guidance nor do we urge the breaking of laws.

3.7 HOW CAN I PREVENT WAKING UP AS SOON AS I BECOME LUCID?

Beginning lucid dreamers often have the problem of waking up right after becoming lucid. This obstacle may prevent some people from realizing the value of lucid dreaming. Fortunately there are ways to overcome this problem.

The first is to remain calm in the dream. Becoming lucid is exciting, but expressing the excitement can awaken you. It is possible to enjoy the thrill that accompanies the dawning of lucidity without

allowing the activation to overwhelm you. Be like a poker player with an ideal hand. Relax and engage with the dream rather than withdrawing into your inner joy of accomplishment.

Then, if the dream shows signs of ending, such as a loss of detail, vividness, and apparent reality of the imagery, the technique of "spinning" can often restore the dream. You spin your dream body around like a child trying to get dizzy. LaBerge developed this technique after experimenting with the idea that relaxing completely might help prevent awakening from a dream. When in a lucid dream that was fading, he stopped and dropped backwards to the floor, and had a false awakening in bed! After a few trials he determined that the essential element was the sensation of motion, not relaxation. The best way to create a feeling of movement, especially in the dream scene has vanished, leaving nowhere to move to, is to create angular momentum (or the sensation of it), by spinning around your axis. You are not really doing it, but your brain is well familiar with the experience of spinning and duplicates the experience quite well. In the process the vestibular and kinesthetic senses are engaged. Presumably, this sensory engagement with the dream discourages the brain from changing state from dreaming to waking. Note that dream spinning does not usually lead to dizziness. Be aware that the expectation of possible awakening sometimes leads to a "false awakening" in which you dream of waking. The vividness of the spinning sensation may cause you to feel your spinning arm hit the bed. You think, "Oops, I'm awake in bed now." Think now--your physical body wasn't really spinning, it was your dream body--therefore, the arm is a dream arm hitting a dream bed! To avoid being deceived, recite, "The next scene will be a dream," until a scene appears. If you are in doubt about your status, perform a thorough reality test.

Research at the Lucidity Institute has proven the effectiveness of spinning: the odds in favor of continuing the lucid dream were about 22 to 1 after spinning, 13 to 1 after hand rubbing (another technique designed to prevent awakening), and 1 to 2 after "going with the flow" (a "control" task). That makes the relative odds favoring spinning over going with the flow 48 to 1, and for rubbing over going with the flow, 27 to 1.

4.1 WHAT ARE THE BEST RESOURCES FOR LEARNING MORE ABOUT LUCID DREAMING?

Over the past fifteen years, exercises, techniques and training materials have been developed and refined to the point where most anyone can learn to have lucid dreams if they are willing to devote time and effort. The Lucidity Institute offers lucid dreaming training through several modalities. To start, most bookstores carry the book Exploring the World of Lucid Dreaming (EWLD) by LaBerge and Rheingold (Ballantine, 1990), or you can order it online from Amazon.com. It presents a step-by-step training program with exercises and an introduction to the various possible applications of lucid dreaming. The Lucidity Institute's A Course in Lucid Dreaming (included with the NovaDreamer package) provides a more thorough training program with five units of exercises and a workbook for tracking your progress. EWLD is the textbook for the Course.

There are several other good resources, although caution is in order when buying books on lucid dreaming. Some are poorly researched and present claims or methods that have not been rigorously tested. Below is a list of books and audio tapes that we have found valuable for introducing the facts about lucid dreaming, conveying something of the experience, or assisting with training. Some excerpts from the books are available on The Lucidity Institute website.

LUCID DREAMING
By Stephen LaBerge, Ph.D., (Ballantine, 1986; ISBN 0-345-33355-1)
This is the seminal work that first brought lucid dreaming to the attention of the general public

and legitimized it as a valuable field of scientific inquiry. It is still the best general reference on lucid dreaming and a pleasure to read. The phenomenon of lucid dreaming is explored from many angles, beginning with the history of the practice in human cultures. LaBerge describes the early days of the scientific research and tells the story of his successful challenge of the established school of thought in sleep research, which held that awareness while dreaming was impossible. He discusses many methods of lucid dream induction, including the way he taught himself to have several lucid dreams per night. Other topics covered include: contemporary theories of the function of dreaming "Dreaming, Function, and Meaning", applications of lucid dreaming, the relationship of lucid dreaming to out-of-body and near-death experiences, and the possibility of using lucid dreaming as a gateway or stepping stone on the path to spiritual enlightenment. See Annotated Table of Contents for more details. Out of print; Check Addall.com, Half.com, Amazon.com, and other online bookstores for a used copy.

EXPLORING THE WORLD OF LUCID DREAMING
By Stephen LaBerge, Ph.D. and Howard Rheingold (Ballantine, 1990)
A practical guide for lucid dreamers. The first half of the book establishes a basic understanding of sleep and dreams, followed by a progressive series of exercises for developing lucid dreaming skills. These include cataloging "dreamsigns," your personal landmarks that tell you when you are dreaming, the Reflection-Intention and MILD techniques for becoming lucid within the dream and methods of falling asleep consciously based on ancient Tibetan Yoga practices. Induction methods are followed by practical advice on maintaining and guiding lucid dreams. After presenting the lucid dream induction techniques, Dr. LaBerge explains his understanding of the origin of dreams, founded on current views in the sciences of consciousness and cognition. This provides a foundation for the methods of employing lucid dreams to enhance your life, which are detailed in the second half of the book. The applications considered are: adventures and explorations, rehearsal for living, creative problem solving, overcoming nightmares, healing, and discovery of expanded awareness and spiritual experience. Many delightful and illuminating anecdotes from lucid dreamers illustrate the use of lucid dreams for each application. See Annotated Table of Contents for more details. You can order from Amazon.com.

A COURSE IN LUCID DREAMING
By Stephen LaBerge and Lynne Levitan (Lucidity Institute, 1995)
This is a comprehensive home-study training program in lucid dreaming. It takes you from the beginning stages of improving your dream recall and becoming familiar with the hallmarks of your dreams, through several different techniques for increasing your ability to have lucid dreams, to mastery of the art of lucid dreaming. All known methods of lucid dream induction are covered. Many focusing exercises help you develop the mental powers needed to become an expert lucid dreamer. Charts and logs assist you in assessing your skill level and monitoring your progress. The Course has five Units and takes a minimum of four months to complete. The textbook is Exploring the World of Lucid Dreaming. The Course is included with the NovaDreamer package.

CONSCIOUS MIND, SLEEPING BRAIN
Edited by Jayne Gackenbach, Ph.D. and Stephen LaBerge, Ph.D. (Plenum, 1988; ISBN 0-306-42849-0)
Nineteen dream researchers and other professionals contributed to this scholarly volume. It represents a wide spectrum of viewpoints in the field of lucid dreaming study and is an essential reference for anyone interested in studying lucid dreams or applying them in clinical practice. Topics include: literature, psychophysiology, personality, therapy, personal experience, related states of consciousness, and more. Out of print. Out of print; Check Addall.com, Half.com, Amazon.com, and other online bookstores for a used copy.

OUR DREAMING MIND
By Robert L. Van de Castle (Ballantine, 1994; ISBN 0-345-39666-9)
An excellent overview of the vast field of dream research; comprehensive and very well written by one of the field's pioneers. Discounted at Amazon.com.

LUCID DREAMS
By Celia E. Green (Hamish Hamilton, London, 1968)
This is the classic book that inspired Dr. LaBerge to begin his studies of lucid dreaming. Green supplemented the scant published literature on lucid dreaming (e.g., the Marquis de Saint-Denys and Frederik van Eeden) with case histories from her own informants to put together a concise and thoughtful picture of the phenomenology of lucid dreaming. A bit dated, but still worth reading 30 years later. Out of print; Check Addall.com, Half.com, Amazon.com, and other online bookstores for a used copy.

DREAMS AND HOW TO GUIDE THEM
By The Marquis d'Hervey de Saint-Denys, edited by Morton Schatzman, M.D. (Duckworth, London, 1982)
A great pioneer of the art of lucid dreaming, the Marquis first published this exploration of lucid dreaming in 1867, yet this is a very modern, and yes, lucid, thesis. He describes his personal experiments and the development of his ability to exercise control in his lucid dreams. Out of print; Check Addall.com, Half.com, Amazon.com, and other online bookstores for a used copy.

PATHWAY TO ECSTASY: THE WAY OF THE DREAM MANDALA
By Patricia Garfield, Ph.D. (Prentice Hall, 1989)
Delightfully told story of Patricia Garfield's transcendent and erotic adventures with lucid dreaming. Out of print; Check Addall.com, Half.com, Amazon.com, and other online bookstores for a used copy.

CONTROLLING YOUR DREAMS
By Stephen LaBerge, Ph.D. (Audio Renaissance Tapes, Inc., 1987, 60 minutes)
This audio cassette tape captures the essence of Dr. LaBerge's public lectures on lucid dreaming. It is highly informative and inspirational. Use it as an excellent introduction to the topic or a concise refresher. Dr. LaBerge begins by portraying the experience of lucid dreaming. He then presents methods for learning the skill, including the powerful MILD technique. The descriptions he gives of possible applications of lucid dreaming, from creative problem solving and rehearsal for living, to overcoming nightmares and achieving greater psychological integration, will encourage you to learn this valuable skill. Available from Amazon.com.

THE LUCID DREAMER
By Malcolm Godwin (Simon & Schuster, 1994)
Beautifully illustrated with nearly 200 full-color and black-and-white illustrations of little known dream masks and Zen paintings, Aboriginal Australian art, North American paintings, and works by modern native primitives, Surrealists, and schizophrenics. The text is a well-written, thoughtful, and inspiring survey of lucid dreaming as viewed primarily from a philosophical and mystical perspective. Discounted at Amazon.com.

TRANCE INDUCTION OF LUCID DREAMING
By Stephen LaBerge, Ph.D. (The Lucidity Institute, 1993, 40 minutes)
Dr. LaBerge's trance induction is designed to help you create a mind-set in which lucid dreaming will happen easily. The hypnotic induction begins with progressive relaxation accompanied by

guided visualization of calming images. Once you have attained a peaceful state of mind, Dr. LaBerge gives you suggestions for building confidence that you will succeed at having lucid dreams. You are guided in devising a personal symbol to help you to recognize when you are dreaming. Musical accompaniment by Robert Rich. The Trance CD is included with the NovaDreamer package.

4.2 WHERE CAN I FIND LUCID DREAMING WORKSHOPS?

An intensive overview of lucid dreaming techniques is presented at Lucidity Institute lucid dreaming training programs. Attendees are frequently offered the option of purchasing a NovaDreamer at a discount in a package with the workshop fee. To date, most of the training programs have been held in California, but the Lucidity Institute will give one wherever there is enough interest. Dr. LaBerge gives weekend seminars at the Esalen Institute in Big Sur, California about once a year, as well as occasional lectures and workshops at other venues. To find out about upcoming events, sign up for the LI mailing list.

The Lucidity Institute offers several DREAMING AND AWAKENING lucid dreaming programs, in which a few dozen oneironauts (explorers of the dream world) convene for ten days to dedicate day and night to developing their lucidity skills under the guidance of Dr. LaBerge. See Keelin's "Diary From Lucid Dream Camp" for a review. These residential retreats are usually held on the Stanford University campus or in Hawaii. Attendees live, eat, dream, and meet together, practice exercises, discuss experiences, and follow a specially designed sleep schedule. The intense focus, group support and schedule combine to ensure that participants experience lucid dreams during the program (more than 80% did so in 1998) and are then able to share and obtain advice to guide future lucid dreams. Participants in past retreats have enjoyed the mix of work and play, with 95% evaluating the program as "very" or "extremely satisfying." They have also had great success at lucid dreaming, most have had one or more lucid dreams during the program. The next program is scheduled April 16-25, 2007 on the Big Island of Hawaii.

4.3 WHAT IS THE LUCIDITY INSTITUTE?

The Lucidity Institute is a small business founded and directed by Dr. LaBerge. Its goals are to make lucid dreaming known to the public and accessible to anyone interested, to support research on lucid dreaming and other states of consciousness, and to study potential applications of lucid dreaming. The Lucidity Institute sells books, tapes, and devices. Any profits are used to support further research on dreaming and consciousness. To sign up on our mailing list (for web site updates, events, experiments, new product announcements and special offers), you can complete a short online form for the Lucidity Institute mailing list.

4.4 WHAT QUALIFIES THE LUCIDITY INSTITUTE TO WRITE THIS FAQ?

On the internet, anyone can play "expert", and there are several FAQs on dreaming and lucid dreaming. Which FAQ is authoritative? What qualifies the Lucidity Institute to write this FAQ? Why should readers take its contents any more or less seriously than those of other FAQs? These are all reasonable questions to ask. This FAQ was written by LI staff (primarily Lynne Levitan) and Stephen LaBerge. Dr. LaBerge has had more than 20 years of relevant personal and professional experience, having received his Ph.D. in Psychophysiology from Stanford University for his pioneering laboratory research on lucid dreaming. During the course of his dissertation study he learned to have lucid dreams at will, and has recorded more than a thousand lucid dreams which he has used

for personal growth and exploration as described in his books Lucid Dreaming and EWLD. His contributions to lucid dreaming methodology include developing lucid dream induction techniques (e.g., MILD, the counting technique for falling asleep consciously, and early morning napping), the spinning and hand-rubbing technique for stabilizing lucid dreams, and various lucid dream induction devices such as the DreamLight and NovaDreamer. His scientific contributions include using eye-movement signals to prove the reality of lucid dreams, characterizing the basic physiology of lucid dreams (and coining the terms DILD and WILD), and showing through a variety of experiments that lucid dream actions affect the brain (and to a lesser extent the body) as-if they were actually happening. Lynne Levitan has also had many years of personal and professional experience with lucid dreaming and wrote many of the articles in NightLight.

4.5 WHAT IS THE LUCIDITY INSTITUTE MEMBERSHIP SOCIETY?

The Lucidity Institute aims to encourage as many people as possible to learn lucid dreaming and to use it to grow and improve their lives. We also know that the people who see the potential of lucid dreaming are the ones who can help most to map this new frontier and discover its treasures. The Lucidity Institute membership society is an organization for all people interested in lucid dreaming, novices and experts, laymen and scientists.

Members receive frequent short email updates (LUCIDITY*FLASHES) which may include articles on lucid dreaming -- new findings, applications, speculations, inspiring examples, and experiments for members to participate in at home. The results from the experiments appear in subsequent issues, so members can benefit from them. Some studies are of methods of inducing lucid dreams, or about ordinary dreams, so that novice lucid dreamers can contribute. Others test activities and applications within lucid dreams.

Membership includes a personal account on the Lucidity Institute Forum. The Forum is an online discussion board that allows members all over the world to discuss lucid dreaming. Technical support for Lucidity Institute devices is also available through the Forum. Anyone is welcome to read messages, but only members may post messages and create new topics.

The basic membership fee of US$35 covers the cost of maintaining the membership society and some of the expenses involved in the research described in the next section (4.6). If you choose an upgraded membership, the additional fees will go to fund research on lucid dreaming by Dr. Stephen LaBerge and his colleagues at Stanford University.

4.6 WHAT ARE THE LUCIDITY INSTITUTE'S CURRENT RESEARCH PROJECTS?

The Lucidity Institute's research currently has three foci. These are: the mapping of brain activity during the initiation of lucidity, the study of Tibetan Dream yoga methods of inducing and manipulating lucid dreams, and the development of expert explorers of states of consciousness.

The brain mapping project is an extension of prior research into the psychophysiology of the lucid dream state, which found that high central nervous system activation is a prerequisite for lucidity. The goal is to identify which brain areas are activated during the onset of reflective consciousness in the REM sleep state. With this knowledge, we may be able to develop methods of easily and reliably inducing lucid dreams whenever desired, using biofeedback or direct stimulation.

The study of Tibetan Buddhist techniques of lucid dreaming is aimed at making use of the thousand years of experience accumulated by this tradition. Literature currently available is couched in esoteric language from which it is difficult to discriminate useful techniques from culture-bound ritual. Through online and laboratory experiments, we are testing the effectiveness of lucid dream induction methods found in the Dream Yoga doctrines.

The third aspect of our work is part of the long term goal of the Lucidity Institute to foster understanding of all types of higher states of consciousness. The purpose of this project is to assemble and train a group of individuals with extensive experience in meditation, lucid dreaming, hypnosis, and other altered states to facilitate study of these states' mind-body relations and potential applications and benefits.

4.7 HOW CAN I GET INVOLVED WITH LUCID DREAMING RESEARCH?

Students who wish to conduct research on lucid dreaming can prepare by studying the fields of psychology and neuroscience. Dr. LaBerge and colleagues conduct laboratory research on lucid dreaming at Stanford University. Volunteer (unpaid) research positions can be arranged for those with their own funding.

The best way to contribute to ongoing lucid dream research is through the experiments published in NightLight and on the Lucidity Institute web site. These experiments are designed for individuals to carry out at home and report the results back to the Lucidity Institute for analysis and publication. Much of our current knowledge about the most effective methods of inducing lucid dreams has come from NightLight experiments, as has valuable information about the nature of dreams. We are grateful to our oneironauts (explorers of the dream world) for helping us to advance understanding of dreams and lucidity.

If you live in the Bay Area and are fairly confident you can have a lucid dream in the lab, you are invited to be a subject in laboratory research on lucid dreaming. We receive many offers from volunteers, but time and resources limit us to only using experienced lucid dreamers that are likely to succeed in the lab. If you are interested in volunteering, contact the Lucidity Institute.

4.8 WHY DOES THE LUCIDITY INSTITUTE CHARGE MONEY FOR LUCID DREAM TRAINING?

Lucid dreaming is an extraordinary and powerful state of consciousness accessible to all people. Like the ability to dream, to imagine, to sing and dance, it is a free and joyful expression of life. It also has the power to expand the mind, bringing new insight and even spiritual understanding. Our mission at the Lucidity Institute is to teach our fellow humans about the potential of lucid dreaming and provide means of making the state more accessible to all.

Some of the methods we have created require money to develop, produce and distribute. Those of us who work to bring these materials to the world do this full time and need money to eat, pay rent and afford transportation. Nonetheless, we do not wish to restrict access to lucid dreaming to those with disposable income, so we do whatever we can to help those sincerely interested in lucid dreaming to achieve their goals. This includes scholarships for training programs, and free information. For example, the information on the Lucidity Institute website is published elsewhere for sale. Herein it is free to all, so long as it is distributed intact and unmodified. We would like nothing more than to be a fully charitable organization, promoting lucid dreaming, which we believe

has value for transforming human consciousness and improving our world, to all without fee. Such a dream could become real through generous endowments from individuals with vision. Until this manifests, however, we must continue to work within the structure of our market-based economy.

4.9 HOW CAN I CONTACT THE LUCIDITY INSTITUTE?

Contact information: http://lucidity.com/Contact.html

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http://lucidity.com/LucidDreamingFAQ.html