

# Dr. Charles Tart's Study of Verified Perception in Out of Body Experiences



By [Kevin Williams](#)

Dr. Charles Tart, [www.issc-taste.org](http://www.issc-taste.org) and [www.paradigm-sys.com](http://www.paradigm-sys.com), is a transpersonal psychologist and parapsychologist known for his psychological work on the nature of consciousness (particularly altered states of consciousness), as one of the founders of the field of [transpersonal psychology](#), and for his research in scientific parapsychology. He earned his Ph. D. in psychology from the [University of North Carolina at Chapel Hill](#) in 1963. His first books, [Altered States of Consciousness](#) and [Transpersonal Psychologies](#), became widely used texts that were instrumental in allowing these areas to become part of modern psychology. Dr. Tart has been involved with research and theory in the fields

of hypnosis, psychology, transpersonal psychology, parapsychology, consciousness and mindfulness since 1963. He has authored over a dozen books, two of which became widely-used textbooks; he has had [more than 250 articles](#) published in professional journals and books, including lead articles in such prestigious scientific journals as [Science](#) and [Nature](#), and provides regular public speaking appearances.

The following is an excerpt from an article by Dr. Tart which was published in the [Journal of the American Society for Psychical Research](#). In it, Dr. Tart documents the out-of-body experience of a young woman who was one of his research subjects. What makes this particular out-of-body experience remarkable is that she was able to leave her physical body and read a 5-digit number, which was at a significant distance, and correctly give it to him upon return. Her OBE a good example of "[veridical perception](#)" which is where verified events are observed while in an out-of-body state.

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## 2. A Psychophysiological Study of OBEs in a Selected Subject

by Charles T. Tart

Originally published in the [Journal of the American Society for Psychical Research](#), 1968, vol. 62, no. 1, pp. 3-27.

**ABSTRACT:** A young woman who frequently had spontaneous [out-of-body experiences](#) was studied in a sleep laboratory for four nights. She reported several partially out experiences and two full ones. While the physiological data are limited by dependence on her retrospective report in correlating physiological pattern with the experience, it seems as if her out experiences occurred in conjunction with a non-dreaming, non-awake [brain wave](#) stage characterized by predominant slowed [alpha activity](#) from her brain and no activation of

the [autonomic nervous system](#). Two incidents occurring in the laboratory provide suggestive evidence that the out-of-the-body experiences had [parapsychological](#) concomitants.

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### 3. Introduction to the OBE Study

Out-of-the-body (OOB) experiences have always been a peripheral problem in psychical research in spite of the fact that their important implications for the question of survival, as well as their inherent interest, have long been recognized. This neglect has been due to the fact that an experimental approach to the study of OOB experiences is extremely difficult. In the vast majority of reported cases, the experience occurred only once in the lifetime of an otherwise "ungifted" person. The occasional persons who have claimed to produce such experiences at will (26, 44, 64) have, by and large, not been investigated by psychical researchers, although the reason for this lack of investigation is not clear. The few "experimental" attempts to produce such experiences have almost exclusively been older attempts involving the use of [hypnosis](#) (8, pp. 146-154; 21).

Thus we have a phenomenon whose occurrence is quite rare, which we do not know how to produce experimentally, and whose "spontaneous" occurrence cannot be predicted. We cannot study a phenomenon very thoroughly which does not occur when we are prepared to study it. Aside from [Hornell Hart's](#) excellent beginning work (29; 30, pp. 91-93; 31) and some recent work by [Robert Crookall](#) (10, 11, 12) on the experiential content of reported OOB experiences and some of their reported antecedents, we know virtually nothing about the nature of such experiences and their possible causes.

I have been interested in OOB experiences for several years and have often talked about this phenomenon with acquaintances. During a conversation with a friend (whom we shall call Miss Z) a couple of years ago, she reported that she had spontaneous OOB experiences approximately two to four times a week and that she would be interested in being studied in the laboratory. As this afforded an unusual opportunity for research, I studied her for four nights in a sleep laboratory in order to determine what, if any, psychophysiological correlates of her OOB experiences occurred. This paper will describe Miss Z and her spontaneous experiences, and report on the psychophysiological studies which were carried out.

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### 4. Description of Miss Z

Miss Z is a young, unmarried woman in her early twenties, with two years of college education. Her education was temporarily interrupted at the time of this study because of her need to work in order to earn money to continue at college. She is a warm and highly intelligent person, and had great interest in what the study would show.

Psychologically, it is extremely difficult to describe Miss Z. My informal observations of her over a period of several months (undoubtedly distorted by the fact that one can never describe one's friends objectively) resulted in a picture of a person who in some ways was quite mature and insightful, and in other ways so extremely disturbed psychologically that at times, when she lost control, she could possibly be diagnosed as [schizophrenic](#). Miss Z came from a broken home. She recounted a number of instances of apparent parapsychological interaction between her and her parents as well as between her and her foster parents. She had been hospitalized for several weeks for psychiatric treatment about a year prior to the present study. Despite numerous psychological difficulties in her personal life during the several months over which the experiment was carried out, however, Miss Z did not interject her personal difficulties into the experimentation.

Miss Z's OOB experiences were almost all of one kind. She would wake once or twice during a night's sleep. Each time she would find herself floating near the ceiling, but otherwise seemingly wide awake. This condition would last for a few seconds to half a minute. She frequently observed her physical body lying on the bed. Then she would fall asleep again and that was all there was to the experience. As far as she could recall, these experiences had been occurring several times weekly all of her life. As a child, she had not realized that there

was anything unusual about them. She assumed that everyone had such experiences during sleep, and never thought to mention them to anyone. After speaking about them to friends several times as a teenager, however, she realized that they were looked upon as "queer" experiences, and she stopped discussing them.

At the time of the experiment, she had never read anything about such experiences. After initially hearing about her experiences, I asked her to refrain from reading anything about them until our experiments were completed, and she complied with this request.

Note that Miss Z had never made any attempts to control her OOB experiences, nor did she attach any great significance to them. She definitely felt that they were not **dreams**, but she was otherwise puzzled as to what they were.

On a few occasions Miss Z's OOB experiences had seemed to transport her to distant locations, rather than just floating above her body. One experience she reported is particularly relevant here. It is not certain whether it was a nightmare with elements of **ESP** in it, or a genuine OOB experience. At about the age of fourteen, she had a vivid "nightmare" in which she found herself walking down a dark street in a deserted part of her own home town. She noticed the clothes she was wearing, including a checked skirt; she realized that she did not own any clothes like this, and felt that she was in someone else's body. Someone was following her, and she was terrified. This person caught up with her, raped her, and then stabbed her to death. Miss Z's memory of what happened near the end of this sequence is very poor, but she awoke quite disturbed and horrified because this "nightmare" had seemed so terribly real. She reported that the next day there was a story in the newspaper about a girl who had been wearing a checked shirt having been raped and stabbed to death the previous evening in the part of town corresponding to her "nightmare" locale. This experience made a considerable impression on Miss Z and will be relevant to one of the events which happened in the laboratory, described below.

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## 5. Preliminary Experiment

My interest in OOB experiences has two separate facets. On one level, I am interested in such experiences as a unique, psychological experience, possibly related to nocturnal dreaming. On another level, I am interested in the extrasensory aspects of the experience: in some OOB experiences the person reports accurate information about the distant localities he seemed to be at, and such information would apparently have to have been acquired by some form of extrasensory perception. Thus we have a unique psychological experience worthy of study in its own right, as well as an experience that often seems to have parapsychological aspects.

In my initial talks with Miss Z, I explained to her that I was interested in her OOB experiences from both of these points of view. I suggested that she carry out some observations on herself at home, before we began all-night laboratory studies, in order that she might distinguish for herself whether this was a vivid type of dream experience only, or whether it also possessed parapsychological aspects. At my suggestion, then, Miss Z carried out the following procedure.

She prepared ten slips of paper with the numbers one to ten on them and placed them in a large cardboard box. Each night, after getting into bed at home, she shook the cardboard box to randomize the slips of paper, and then, without looking into the box, drew out one slip of paper and put it on her bedside table. She could not see the number on the piece of paper from her position in bed, but anyone with a vantage point of several feet above the bed would be able to read the number clearly. If she awoke while experiencing floating near the ceiling that evening, she was to memorize the number, and then check on awakening in the morning to see whether she had perceived it correctly.

When I saw her two weeks later, she reported that she had tried this for seven nights and found she had been

correct each time on checking in the morning. While this cannot be cited as evidence for some form of extrasensory perception, as it depends entirely on the subject's word, it did suggest that the possible parapsychological aspects of Miss Z's OOB experiences could be studied as well as the psychological experience per se.

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## 6. Laboratory Procedure

I was able to observe Miss Z in my sleep laboratory for four non-consecutive nights, over a period of approximately two months. The procedure was essentially the same on all nights, and will be described here.

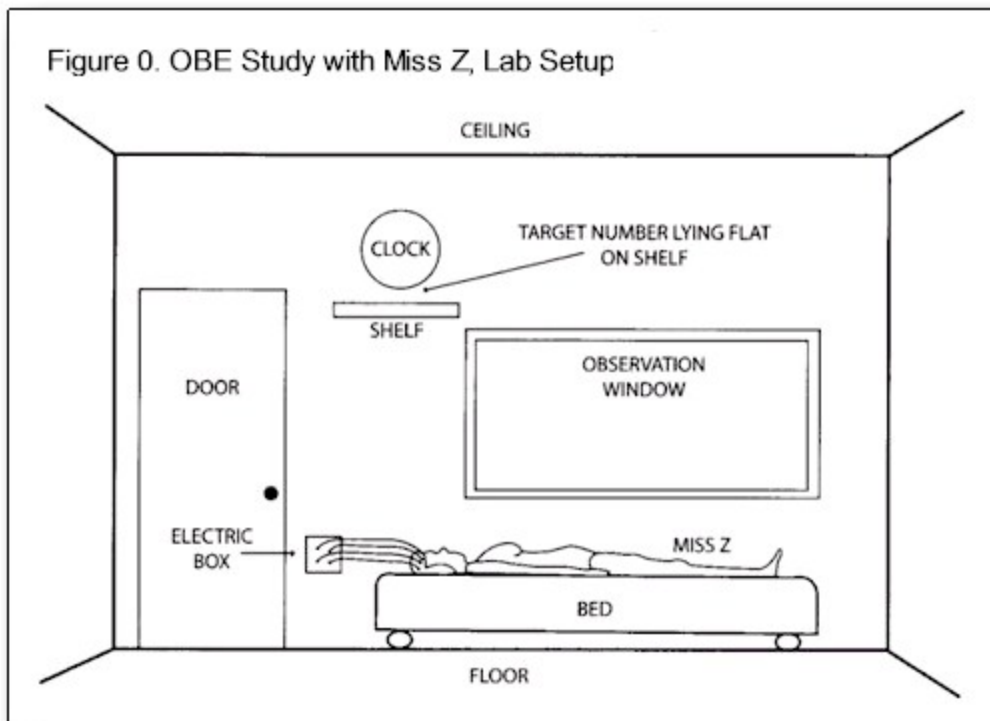
Miss Z's **electroencephalogram** (EEG) was recorded each night. Grass silver disk electrodes were applied to the **vertex**, the right **occipital area**, and the right **frontal area** (high on the forehead, just below the hairline). Recording of the EEG was bi-polar, frontal-to-vertex, and vertex-to-occipital. Recording was continuous through the night on a Grass model VII **polygraph**, running at a speed of ten millimeters per second.

**Rapid eye movements** (REMs) were recorded by means of a miniature strain gauge, taped over the right eyelid. This technique for recording REMs is described in detail elsewhere (4, 58). Movement of the eye under the closed eyelid distorts the strain gauge and a corresponding electrical output is recorded on the Grass polygraph. This combination of two EEG channels and a REM channel is typical in sleep studies and allows one to discriminate the various stages of sleep, including dreaming sleep.

**Basal skin resistance** (BSR) was also recorded on the Grass polygraph. Silver-silver chloride electrodes were used, one on the thenar eminence of the palm of the right hand, the other on the right forearm. These electrodes, described elsewhere (45), have negligible polarization characteristics and provide an accurate record of BSR. **Galvanic skin responses** (GSRs) were recorded from the same electrodes at a higher sensitivity than BSR by capacitively coupling the output of the BSR channel into a high gain channel on a Sanborn polygraph. This latter polygraph ran continuously through the night at a paper speed of one millimeter per second.

On two of the four nights, heart rate and digital blood volume were measured by means of a Grass model PTT1 finger **photoplethysmograph**. This device transmits a beam of light through a finger, and measures the amount of light transmitted by means of a photo cell (7). The output of this photo cell reproduces the pulse wave, allowing heart rate to be measured, and the amplitude of this tracing varies with variations in the blood volume in the finger. Technical difficulties with this device prevented its use on two of the four nights.

The sleep laboratory consisted of two rooms, each lined with acoustic tile for **sound attenuation**. A large window was between the rooms for viewing, but in this experiment it was covered with a Venetian blind in order that the subject's room could be reasonably dark for sleeping. This blind allowed enough light to come through so that the subject's room was dimly illuminated, but not enough to disturb sleep. The polygraphs were located in the second room, and the door was kept closed. An intercom system allowed hearing anything the subject said. I monitored the recording equipment throughout the night while the subject slept and kept notes of anything she said or did. Occasionally I dozed during the night, beside the equipment, so possible instances of sleep talking might have been missed.



The subject slept on a comfortable bed just below the observation window. The leads from all electrodes were bound into a common cable running off the top of her head, and terminating in an electrode box on the head of the bed. This arrangement allowed her enough slack wire so that she could turn over in bed and otherwise be comfortable, but did not allow her to sit up more than two feet without disconnecting the wires from the box, an event which would show up on the recording equipment as a tremendous amount of sixty cycle artifact. Thus her movements were well controlled. Immediately above the observation window (about five and a half feet above the level of the subject's head) was a small shelf (about ten inches by five inches). Immediately above this shelf was a large clock, mounted on the wall. Each laboratory night, after the subject was lying in bed, the physiological recordings were running satisfactorily, and she was ready to go to sleep,

**I went into my office down the hall, opened a table of random numbers at random, threw a coin onto the table as a means of random entry into the page, and copied off the first five digits immediately above where the coin landed. These were copied with a black marking pen, in figures approximately two inches high, onto a small piece of paper. Thus they were quite discrete visually. This five-digit random number constituted the parapsychological target for the evening. I then slipped it into an opaque folder, entered the subject's room, and slipped the piece of paper onto the shelf without at any time exposing it to the subject. This now provided a target which would be clearly visible to anyone whose eyes were located approximately six and a half feet off the floor or higher, but was otherwise not visible to the subject.**

The subject was instructed to sleep well, to try and have an OOB experience, and if she did so to try to wake up immediately afterwards and tell me about it, so I could note on the polygraph records when it had occurred. She was also told that if she floated high enough to read the five-digit number she should memorize it and wake up immediately afterwards to tell me what it was. My conversation with Miss Z after I had prepared the

target was, of course, minimal and could not have given her any clue as to the target number. In future experiments, however, it would be preferable for a second experimenter, who had had no contact at all with the subject, to prepare the targets.

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## 7. The Nature of Sleep

As some readers may not be familiar with recent psychophysiological findings on the nature of sleep, a brief review of these will be presented here. More detailed reviews and evaluations of the more than one hundred studies of the past decade which have so changed our view of sleep and dream activity may be found elsewhere (25, 37, 41, 47, 48, 56, 57).

**Sleep** may be defined in this paper as a stage of the organism indicated (in human subjects) by one of four EEG stages (16, 17). The Stage 1 pattern consists of an irregular mixture of **theta waves** (4-8 cps), random low voltage activity, occasional isolated **alphoid activity** (waves of 1 to 2 cps slower than the subject's waking alpha), and occasional alpha waves (8-13 cps). Stage 2 contains **spindle activity** (14 cps) in addition to the above, and Stages 3 and 4 contain an increasingly larger proportion (up to 100 per cent) of delta waves, 1-3 cps, high amplitude, in addition to spindle activity. The exact divisions between Stages 2, 3, and 4 are arbitrary, based on the percentages of **delta waves** in given epochs. The Stage 1 pattern is readily distinguishable from the other stages by its total lack of spindles and delta waves.

**Stages 1 through 4** were initially conceived of as comprising a continuum from "light" to "deep" sleep (2, 3, 14), but as other measures of the "depth" of sleep contradict this conception (5, 32, 37, 56, 62), this paper will treat sleep as being of two qualitatively distinct types, namely, Stage 1 as one type and Stages 2, 3, and 4 as the other type. Distinctions between Stages 2, 3, and 4 will not be made, and they will be collectively referred to as Nonstage 1 sleep.

If subjects are awakened from the two types of sleep and asked to report on what they have been experiencing, the reports may be classified into two rather distinct types. One type, awakenings from Stage 1 sleep or shortly (within, roughly, ten to fifteen minutes) after Stage 1 sleep has changed to Nonstage 1 sleep, possesses the characteristics traditionally associated with the experience of dreaming (24, 51). Reports from Nonstage 1 sleep seem more like "thinking," and are generally called thinking by the subjects-these same subjects generally refer to their Stage 1 experiences as dreams. The psychological differences reported so far are quantitative rather than being completely dichotomous, but they generally give the impression of being distinct types of experiences.

Stage 1 sleep is almost always accompanied by binocularly synchronous rapid eye movements (REMs), and the evidence is very convincing that these are closely associated with the content of the dream, if not actual scanning movements of the dream imagery (6, 19, 53). Such REMs have not been reported in Nonstage 1 sleep, although there are some slow, rolling movements (37). In view of these findings, the theoretical position taken in this paper is that an experientially distinct type of phenomenon occurs concurrently with the presence of Stage 1 sleep, which phenomenon will be called Stage 1 dreaming, or just dreaming. The mental phenomena of Nonstage 1 sleep will not be considered in this paper. Further, it is assumed that the experience of Stage 1 dreaming is essentially continuous during the presence of Stage 1 EEG, whether or not the subject can always recall this experience on waking. This position is, in my opinion, supported by all the studies using the EEG and REM technique, and directly refuted by none.

For normal subjects, Stage 1 dreaming and Nonstage 1 sleep alternate in a regular cyclic fashion referred to as the sleep-dream cycle. As the subject falls asleep there is generally a brief (a few seconds to a minute or two) period of Stage 1, without REMs, but subjects' reports indicate that this is apparently a period of **hypnagogic** imagery rather than typical dreaming (17, 47). At approximately ninety-minute intervals through the night there are periods of Stage I dreaming, each dream period generally being longer than the preceding

one. The first Stage 1 period may last for ten minutes; the fourth or fifth one may last as long as fifty minutes. Altogether, Stage 1 dreaming occupies between twenty and thirty per cent of the total sleep time of most young adults, spread over three to six Stage 1 periods. While the exact percentage of dream time and the number of cycles varies from subject to subject, for a given subject the **sleep-dream cycle** is generally quite stable from night to night (15,16, 40, 63).

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## 8. Results of Study

### a. Night I

### b. Night II

#### 1. Miss Z's nightmare and the murder case

### c. Night III

### d. Night IV

### a. Night I

The first night in a dream laboratory is usually considered an adaptation night, with the data from it not being used in physiological studies. This is because of the so-called "**first night effect**" in which a subject is liable to skip his first Stage 1 dream period, and the content of his dreams is often obviously concerned with the fact that he is being experimented upon (1, 20, 50, 59, 61).

On her first night in the laboratory, Miss Z fell asleep rather rapidly, reached Stage 4 sleep within the first half hour after falling asleep, and then showed three Stage 1 dream periods during the course of the night. After the first dream period, there were scattered instances of prominent alphoid activity, that is, a Stage 1 pattern mixed with slowed alpha waves, and rather poorly developed sleep spindles. The only unusual feature of this [**Note: Within a continuous period of Stage 1 EEG, the content of the experienced dream may be divided into several distinct episodes so that, in a sense, there are several distinct "dreams" within a continuous period of dreaming. Dement and Wolpert (19) present some evidence that such change of topic may be accompanied by a gross body movement on the part of the subject.**] night was that the subject showed REMs during Stage I **drowsiness** at the beginning of sleep, a very unusual finding. Rapid eye movements almost never occur if normal subjects during drowsiness, although they have been found to occur frequently **innarcoleptics** (18, 36, 49, 52). There is no evidence that Miss Z suffers from narcolepsy, however, and these REMs during drowsiness seem to be related to the unusually vivid hypnagogic imagery that she reportedly experiences on falling asleep.

Miss Z did not feel that she had had any OOB experiences that night.

### b. Night II

A number of interesting incidents occurred during Miss Z's second night in the laboratory.

As Miss Z went to sleep, she showed a drowsy pattern alternating with a waking pattern for approximately the first ten minutes. Then there was a minute of a drowsy EEG pattern consisting of occasional theta waves, some alphoid waves (alpha waves of one to one-and-a-half cycles per second slower than her usual waking alpha), and a good deal of flattening of the record, ending in thirteen seconds of waking alpha rhythm, nearly continuous, and then a large **body movement**. With this body movement, Miss Z called out that she was awake and that she had just had a sensation of starting to float up toward the ceiling immediately prior to her moving and calling out. The finger photoplethysmograph was being used on this night, and her heart rate during this time was a steady seventy-one beats per minute, not in the least unusual. Her BSR was steady throughout this time, no GSRs were seen at all, nor was there any body movement. Also, there were no REMs during this period.

Miss Z then went to sleep, quickly going into Stage 2 sleep, which lasted for about half an hour, and then a half hour of Stage 3 and Stage 4 sleep. This was followed by a short Stage 1 dream. Her Stage 1 dream period showed a classical Stage 1 pattern with REMs. This dream was followed by about an hour and a half of Stage 2 sleep, then twenty minutes of Stage 1 sleep, and then another period of unusual EEG. For approximately one minute Miss Z showed a pattern of alphoid waves mixed with poorly developed, low voltage sleep spindles. Then there was a two-minute period of alphoid waves superimposed on a generally low voltage pattern with no spindles and no clearly developed theta waves. This was followed by a minute of predominantly low voltage theta activity, with very poorly developed sleep spindles present, This terminated in a large movement and Miss Z awoke, There were no REMs during this four-minute period, heart rate was steady at seventy-four beats per minute, and BSR steady, with no GSRs. There were two small body movement artifacts during the terminal period of slowed alpha without spindles and one small body movement in the period of slowed alpha and poor spindling which began this unusual EEG sequence. The sequence occurred at approximately 3:15 A.M.

Upon awakening from this sequence, Miss Z called out:

"Write down 3:13 A.M. I don't see the number, but I just remember that."

Although she did not say anything more, the implication, confirmed by conversation later on that morning, was that she had: floated somewhat above her body, high enough to see the clock, but not high enough to see the target number. Some further comments on this episode will now be made.

When going back to sleep, Miss Z showed a Stage 2 pattern for an hour, had a dream of twenty-five minutes' duration following that, then showed some Stage 2 and Stage 3 for the next hour. About fifteen minutes of record was then lost because of a paper jam. When recording was resumed, she was showing Stage 1 dreaming. This lasted for about ten minutes, and then the record became rather difficult to classify. For a period of approximately ten minutes the EEG consisted of a great deal of slowed alpha rhythm, no theta rhythm, and a fair amount of flattening. It could not be classified clearly as either a sleep or a waking pattern. There were some occasional body movements, a fair amount of REM activity scattered through, and some GSR activity. Miss Z then awakened by herself and reported that in the last five minutes she thought she had floated in and out of her body four or five times. Nothing else of interest occurred that night.

One day later, Miss Z told me that she had had a very frightening **nightmare** during her previous night in the laboratory, which she had not reported at the time because of its terrifying nature. She had wanted to forget it, but had not been successful. This nightmare had apparently occurred just before she woke, called out the time, and reported that she had not been able to see the target number. I cannot be sure of this, of course, as she did not report it at the time. The stimulus for now reporting it was that she had seen a television news program the night following her night in the laboratory which made her decide to write down an account of her nightmare immediately because it seemed to coincide with an item in the newscast.

Because Miss Z did not report this material to me before seeing the newscast, it cannot be considered evidential of extrasensory perception. As it is quite interesting psychologically, however, and fits in with the earlier traumatic incident of her childhood (described above) in which she had a nightmare or OOB experience coinciding with the murder of a young girl, the material will be reproduced here. Her account, written after she saw the newscast, is as follows:

Sunday night - vague nightmare - recalled previous experience ? - blocking on much of memory - young girl (13 to 16?) - outdoors? - stabbing, but not knife, more slender - head hurt (slapped ?) - not stabbed, surely - expanse of white, car white ? - knew fellow (she knew, not !!) who also youngish - horrible experience but no support in papers this morning - so far so good.



Miss Z told me that the television newscast said that a young girl had been stabbed to death in Marin County. Whether additional information was given in the newscast is not known.

I did not check the newspapers at the time; I wanted the incident to die down as Miss Z was obviously rather disturbed about it. Several months later I checked the newspaper files in the library. Nothing had appeared in the papers until April 20, 1965. Miss Z's second night in the laboratory had been the night of April 18th. Thus, as she had said, there had been nothing in the morning paper after she had seen the TV newscast. I do not know if she saw anything which appeared in the paper after that. The following material has been taken from the April 20, 1965, edition of the San Francisco Chronicle. (I have left out details such as names and the like which are not relevant to Miss Z's nightmare.) The headline is "Girl Found Murdered in Marin." Marin is the county immediately above San Francisco, about forty miles north of the laboratory.

"A pretty Daly City high school girl was found murdered on a flower covered slope in Muir Woods in Marin County yesterday afternoon. She had been stabbed savagely in the head at least six times and her skull was crushed, Coroner Frank Keaton said. There was no indication that she had been raped.... The young victim was identified as Nonita \_\_\_\_\_, sixteen. Nonita's boyfriend is also missing and is sought for questioning.... He was identified as Virgilio \_\_\_\_\_, nineteen, a resident of a San Francisco hotel. He is driving a white 1960 Thunderbird, police said.... The victim was fully clad - though her underclothing was in some disarray - in a black sweater, red blouse, plaid skirt, tennis shoes, and white socks. Keaton estimated that she had been dead three or four days."

In the Chronicle for April 21st, the information is given that the police are still looking for the boyfriend, and that the car has been found:

"... the murder weapon-a sharp, thin instrument, a little thicker than an ice pick-was not found ... An autopsy showed that death came from six stabs of this weapon into her head, one of them penetrating the brain."

The Chronicle of April 22nd reports that the girl was murdered in the car, according to bloodstains and signs of a struggle found in the car. The Thunderbird was parked in a San Francisco parking garage late Friday night, and the body was apparently in it for attendants noticed a little pool of blood in the parking place after the car was checked out.

After a small notice on April 24th in the Chronicle that the FBI had entered the case, I could find no more information about the murder, though I searched the paper for the next several weeks.

1. With respect to the parallels between Miss Z's nightmare and the murder case, we note the following:

1.	The victim was a young girl of sixteen, as estimated in the dream.
2.	The setting of the nightmare was outdoors and the body was apparently out-doors, where it was found, at the time of the dream, although the murder took place in the car.
3.	Death was caused by stabbing with an instrument like an ice pick, not a knife.
4.	Miss Z said her head hurt, that it was slapped, not stabbed; the girl was stabbed in the head and her skull was crushed
5.	Miss Z saw an expanse of white in her dream and thought it was a white car; the suspected murderer was driving a large white car
6.	Miss Z said the murderer, a "youngish man," knew the girl; the suspected murderer was a young man who was a boyfriend of the girl.

The parallels between this nightmare, the actual killing, and the incident Miss Z reported from her early teens is striking. In the earlier nightmare incident, the girl Miss Z identified with was also wearing a checked or plaid skirt. In one sense, this entire recent incident may be a reactivation of the earlier trauma. (As mentioned above, the nightmare can only constitute suggestive evidence for extrasensory perception because it was not reported to me before Miss Z saw the television newscast.) An alternative hypothesis is that no nightmare took place in the laboratory, but that the TV news bulletin triggered the earlier trauma in Miss Z's mind and she fabricated (unknowingly) the incidents of the nightmare.

### c. Night III

On her third night in the laboratory, Miss Z went to sleep quickly and showed an ordinary sleep pattern for the first half of the night, that is, Stages 2, 3, and 4 alternating with a couple of Stage 1 dream periods at approximately ninety-minute intervals. At 3:35 A.M. an unusual EEG pattern sequence started which will be described here. It began from Stage 3 sleep, which was clearly defined by frequent, well-developed sleep spindles and clear, high voltage delta activity. Then there was a minute of large body movements, followed by five minutes of alphoid activity with no spindles, some flattening of the record, and no REMs. Then there was another minute of massive body movements, followed by a half minute of rather poorly developed Stage 1 EEG, that is, a flattened low voltage slow pattern, but with the theta almost absent and no REMs. Again there was a half minute of body movements, and then five minutes of alphoid activity as before. There were several bursts of twenty-four cycle per second rhythmic activity in the frontal channel during this five-minute period, but it is not clear whether these were actually EEG patterns or some sort of external electrical artifact which happened to occur at this time. Then for two and a half minutes the alphoid activity was less prominent, there was some theta activity, but still no spindle activity. Then there were five minutes of record that could not be classified because body movements obscured almost all of it except for occasional slowed alpha. Then there was a minute in which the EEG record was clear and showed alphoid activity predominantly, but the strain gauge REM channel showed all sorts of artifact, such as one might get from tremors of the eyelids. This was followed by seven minutes of alphoid activity, with some flattening, and continual interference and possibly tremor on the strain gauge REM channel. Then, after some more body movement, there were three minutes of waking alpha rhythm with high amplitude REMs. The subject may very well have been awake during this brief period. Then followed a minute and a half of Stage 1 pattern with REMs (dreaming), although the theta was rather poorly developed. There were some occasional bursts of twenty-four cycles per second activity in both EEG channels again. This gave way to seventeen minutes of alphoid activity with no REMs and only a couple of small movements of the body scattered through this period. There were occasional GSRs during this long period of EEG disturbance. Then there were a couple of minutes of Stage 1 EEG pattern, with occasional REMs (dreaming), and Miss Z awoke. She reported on OOB experience. After her final awakening later in the morning, she wrote a full account of this experience, as follows:

"I seemed to be flying, although too high and seemingly fast to recognize where I was; neither did I have any sense of where I was going. The flying disturbed me as I knew I was supposed to stand up in the room and read the number above my head. Therefore, I would rouse or questionably awaken and realize that I was still lying on the bed. Every time I drifted off to sleep I would resume flying, however. This was not preceded by any other activity-that is, there seemed to be no intermediate experience between falling asleep on the cot and flying. Finally, the third or fourth time I flew I decided to relax and let the experience come to completion. Very shortly (that is, in far less time than was objectively possible- I would say less than two minutes) I realized I was on my way home; that somehow my sister was involved in the experience. Essentially simultaneously with this realization I found myself in my home in Southern California, in the living room. Seated in the rocker was my sister, dressed in her pajamas. She seemed upset, somewhat frightened; however, she recognized me immediately and did not seem particularly surprised to see me. We did not talk, but we

seemed to communicate (i.e., I knew she had had a nightmare, she welcomed me, etc.). After standing with her (she had arisen when I appeared) for a brief period of time, we walked back to her bedroom where I observed her body asleep on the bed - she was lying on her right side and seemingly tranquil. The sister with whom I had been communicating observed that it was probably time for me to go and I agreed. Almost simultaneously with this understanding I began to rouse and to realize I was back in the lab."

I was unable to contact the sister before Miss Z went home for a visit a few weeks later, so this experience cannot be considered as to possible parapsychological aspects. On this visit home, Miss Z discussed the incident with her sister, and reported that the latter vaguely recalled having a dream about Miss Z visiting her at about the proper time, but unfortunately no written records were made. As for the experience per se, this sort of OOB experience in which she seemed to travel a great distance was unusual for Miss Z.

After reporting the experience described above, Miss Z went back to sleep, had a couple more Stage 1 dreams during the night, and was awakened by me at 6.50 A.M. so that she could get to work.

#### d. Night IV

On reporting to the laboratory on the fourth night, Miss Z seemed to be determined to have the right kind of OOB experience. Although I had indicated complete satisfaction with her performance so far, she was angry at herself because she had not been able to float up and read the target number.

Miss Z went quickly to sleep, entering Stages 3 and 4 less than fifteen minutes after going to bed. The night was uneventful for the most part - there were several Stage 1 dream periods in the first two-thirds of the night, as would be expected for any normal subject. After four and a half hours of sleep, she had a Stage 1 dream period with REMs which lasted for half an hour. The EEG was technically rather poor on this night, being obscured with a great deal of sixty cycle artifact and requiring rather heavy high frequency filtering to make it clear, so the EEG findings should be taken with the realization that they are subject to more error than usual. Miss Z's Stage 1 dream terminated with several minutes of intermittent body movements and EEG artifact. Then (at 5:50 A.M.) the occipital channel showed an enlarged, slow wave artifact, the REM channel showed no REMs, and the record looked like a Stage I tracing; however, I could not be sure due to the considerations mentioned above. At 5:57 A.M. the slow wave artifact was lessened and the record looked somewhat like Stage 1 with REMs, but I could not be sure whether this was a waking or a Stage I record. This lasted until 6:04 A.M., at which time Miss Z awoke and called out that the target number was **25132**. This was correct (with the digits in correct order), but I did not say anything to her at this point; I merely indicated that I had written the number down on the record. I then told her she could go back to sleep, but twenty minutes later I awakened her so that she could get ready to go to work. At this time, she described her experience as follows:

"I woke up; it was stifling in the room. Awake for about five minutes. I kept waking up and drifting off, having floating feelings over and over. I needed to go higher because the number was lying down. Between 5:50 and 6:00 A.M. that did it. ... I wanted to go read the number in the next room, but I couldn't leave the room, open the door, or float through the door. . . . I couldn't turn off the air conditioner! "

It should be mentioned that Miss Z had expected me to prop the target number up against the wall on the shelf; actually, I had laid it flat on the shelf, which she correctly perceived. Also, I had put a second number on a shelf in the equipment room, but she reported she could not get into this room to see the number. Neither could she turn off the air conditioner, and she complained - that although it had been stifling, it was too cold in the room by that time.

Since Miss Z's correctly calling a five-digit number ( $P = 10^{-5}$  [i.e., odds of 1 in 100,000]) was the first strong

evidence that her OOB experiences contained a parapsychological element, I inspected the laboratory carefully the next day to see if there was any way in which this number [**Note: I was assisted in this by Dr. Arthur Hastings, whom I wish to thank.**] could have been read by non parapsychological means. As a first alternative to an explanation involving extrasensory perception, we decided that "sophisticated" cheating by Miss Z was not impossible. She might have concealed mirrors and reaching rods in her pajamas and used these during the period when the EEG was difficult to classify (due to movement artifacts) to read the number. While this is possible, I personally doubt that it occurred. The second alternative is that she might have seen the number reflected in the surface of the case of the clock which was mounted on the wall above it. This was the only reflecting surface in the room placed in such a way that this might have been possible. Both Dr. Hastings and I spent some time in the dimly lit room to dark-adapt our eyes, and tried to read a number from the subject's position on the bed, as reflected on the surface of the clock. As the room was dimly lit and the surface of the clock was black plastic, we could not see anything of the number. However, when we shone a flashlight directly on the number (increasing its brightness by a factor somewhere between several hundred and several thousand) we could just make out what the number was in the much brighter reflection. Thus, although it seems unlikely, one could argue that the number constituted a "subliminal stimulus" in its reflection off the clock surface. Therefore, Miss Z's reading of the target number cannot be considered as providing conclusive evidence for a parapsychological effect.

After calling out the number, Miss Z again returned to sleep and spent approximately twenty minutes in a stage where the EEG was again quite difficult to classify. It was a generally low voltage, flattened record which looked rather like a poorly developed Stage 1 record. However, there were no REMs to speak of, and there was only a small amount of alphoid activity. Upon awaking, she reported that she had had a number of floating sensations during this time.

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## 9. Discussion

In the course of four nights in the laboratory, Miss Z reported three clear-cut incidents of "floating" and two instances of feeling completely out of her body. The floating incidents, according to her accounts, were all characterized by the feeling that she was starting to rise up above her body, but only slightly, and then [**Note: The set-up of the room was changed slightly in preparation for a fifth laboratory night, and the shelf was extended so that no reflection could be seen off the clock from the subject's position in bed. However, personal difficulties forced Miss Z to return to her family's home in Southern California before a fifth laboratory night could be scheduled**] being back in her body, usually waking in the process. The "nightmare" during her second laboratory night is not clearly classifiable as an OOB experience.

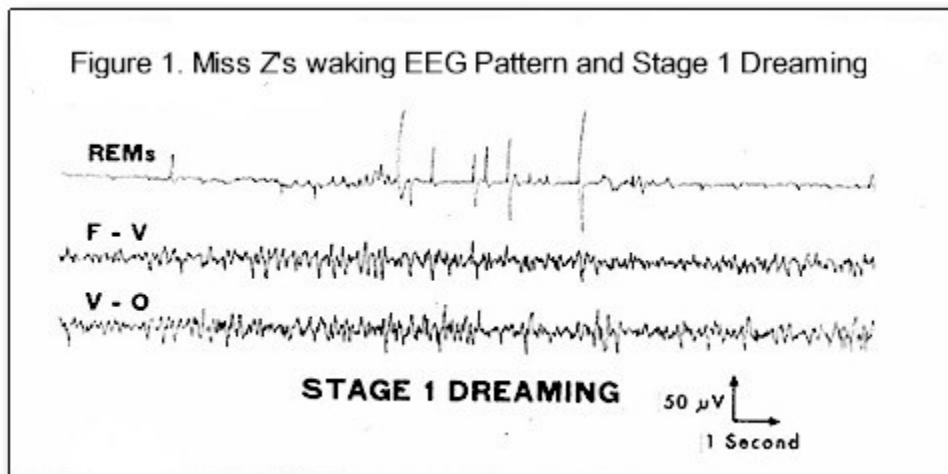
Only the final night in the laboratory produced a report of an OOB experience giving fair evidence of parapsychological concomitants (her reading of the target number), but as this evidence is not conclusive, the remainder of this discussion will focus on the subjective experience of being out of the body, and on the concomitant psychophysiological states.

It is difficult to state conclusively what kind of EEG pattern accompanied the floating experiences and full OOB experience because we must depend on Miss Z's retrospective report for the approximate times when they occurred. In connection with most of these experiences, she reported waking up briefly several times during their course; thus, one would expect whatever pattern accompanied them to be mixed with transitory waking patterns, as well as with the body movement artifacts which generally accompany waking from sleep. My general impression of the EEG correlates of Miss Z's floating and OOB experiences is that they occurred during a rather poorly developed Stage 1 pattern which was dominated by alphoid activity and often mixed with transitory periods of wakefulness. This alphoid activity was always one to one and a half cycles per second slower than her normal alpha rhythm. No REMs seemed to accompany these experiences and, judging from the one night when the plethysmograph was working satisfactorily and the two nights when the skin resistance channel was working satisfactorily, there are no marked autonomic alterations concomitant with the

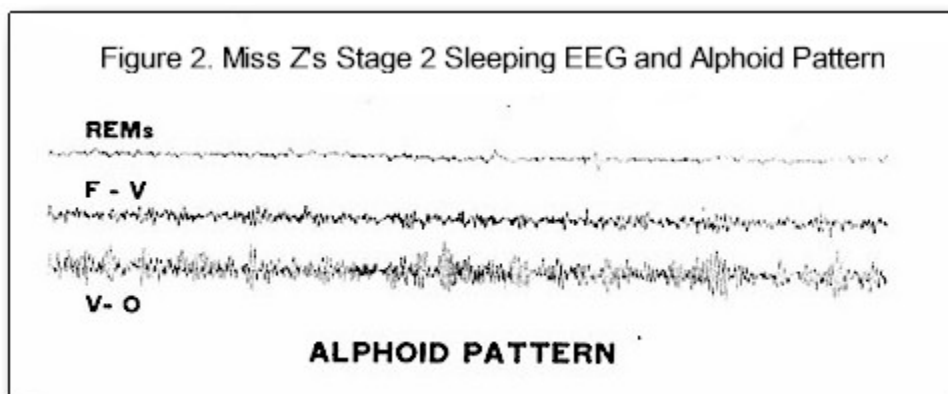
experiences; that is, heart rate stays at a normal, steady rate, and there is no pronounced change in either BSR or spontaneous GSR activity.

Further, it can be stated with some certainty that Miss Z's OOBs experiences do not occur in a normal state of Stage 1 dreaming. She showed normal, well developed Stage 1 EEG and REM patterns, but she did not report OOB experiences in conjunction with these patterns unless they changed into the alphoid pattern, without accompanying REMs.

**Figure 1** shows a typical example of Miss Z's waking EEG pattern and an example of Stage 1 dreaming with REMs.



**Figure 2** shows a sample of Stage 2 sleep with an example of the prominent alphoid pattern she showed in conjunction with her OOB experiences; this particular example is taken from her second laboratory night when she reported seeing the time.



Considering, then, that we have a fairly good correlation between Miss Z's reported OOB experiences and a relatively distinct neurophysiological pattern, how would we describe her physiological state? Here we run into considerable difficulty. The mixture of Stage 1 and pronounced alphoid activity, along with no REMs or cardiovascular or skin resistance changes, has not been described before, to my knowledge, in the sleep literature.\* The particular [**Note:** \* Alphoid activity is usually mentioned as a component of Stage 1 sleep, but there are no quantitative standards available as to how much alphoid activity is typical. Thus I am depending upon personal experience with dozens of sleep records in forming my impression that Miss Z's alphoid activity was exceptionally prominent during her OOB experiences.] pattern cannot be unequivocally classified as a waking pattern, nor can it be unequivocally classified as any of the known stages of sleep. Nor is it a typical

Stage 1 drowsy pattern by any means, because of the pronounced alphoid activity. Dr. William Dement, one of the world's leading authorities on sleep research, kindly looked at these patterns, and agreed with me that they could not very well be classified into any of the known sleep stages, nor could they even be classified unambiguously as waking or drowsy patterns.

From some points of view, we could say that Miss Z was in a hypnagogic state at the time of her OOB experiences, or in a transitional state between sleeping and waking; but simply putting a familiar label on the state tells us nothing about its nature. Furthermore, the presence of so much alphoid activity is not typical of hypnagogic states. However, some interesting literature is starting to come out of Japanese laboratories on the slowing of the alpha rhythm during Zen meditation (35, 38, 39).

The significance of alphoid activity is difficult to assess. In ordinary subjects, alpha frequency tends to decrease with advancing age (34, 41), but this is a long-term decline rather than a transient change. Acute alcoholic intoxication transiently lowers EEG alpha frequency (13, 22, 54), as does acute anoxia and hypoglycemia (23). For normal subjects not subjected to such drastic treatments, however, I can find no reports of such transient alpha slowing or its possible significance.

One other unusual experimental treatment has been reported to result in slowed alpha activity, viz., sensory isolation. Heron (33) presents graphs which show a shift from alpha activity predominating at 10 cps for three normal subjects to 9 cps for two of them and 8 cps for one of them at the end of ninety-six hours of isolation. Even more drastic shifts to alphoid activity are reported by Zubek, Welch, and Saunders (65) for a longer isolation period. Heron also mentions that some subjects felt as if another body were lying beside them, sometimes overlapping with their physical body, although it is not clear from his report whether these were the same subjects who showed alpha slowing. In any case, it would be interesting to follow up on these findings. This is a transient alpha slowing in otherwise normal subjects, but further equating of the states of Zen meditation or sensory isolation with Miss Z's state during her OOB experiences would be quite speculative at this time.<sup>5</sup>

There is one sleep study (42) in which considerable alphoid activity was reported in the sleep records as a result of chlorpromazine administration. Chlorpromazine is a fairly commonly used tranquilizer known under the trade name of Thorazine. A friend indicated that Miss Z might have been taking trifluoperazine (Stelazine) at the time of the study. Neither Miss Z herself, her roommate, nor her boyfriend recall that she was taking this at the time of the study, but it remains a possibility. There have been no studies of the effect of this drug on the sleep EEG, but the possibility should be borne in mind that Miss Z might have been taking this medication, and that it might have contributed to the alphoid activity in her patterns. But even if this were true, it would not account for the findings, as the fact remains that her OOB experiences were associated with this unique pattern, which was quite distinguishable from the normal sleep stage patterns. Indeed, one might speculate that drugs which tend to slow alpha frequency might promote OOB experiences, and this could be a possibly fruitful line of experimental inquiry.

It is important to note that Miss Z's psychophysiological state during the OOB experiences was not at all what one would predict from reading various occult works on OOB experiences or "astral projections" (21, 26, 44, 46), or from accounts of OOB experiences reported in conjunction with serious illnesses or accidents (10, 11, 12, 43). These works lead one to expect that a "death-like trance" accompanies OOB experiences, in which respiration and heart beat would be markedly slowed, temperature might fall considerably, and in which one would probably see the sort of brain waves (high voltage slow waves) characteristic of coma (55). Miss Z did not seem to be in a "death-like trance." When it was measured, her heart rate was normal and steady, there was no unusual autonomic activity, and the Stage 1 and alphoid activity in the EEG was not what one associates with coma.

Closer reading of some of the techniques described in the occult literature for producing OOB experiences

(e.g., 9, 26, 27,28, 44, 46), however, suggests that there may be several distinct sorts of [Note: I hope to do some work in the near future with another woman who claims that she can have OOB experiences at will. She has participated in a colleague's experiment on operant control of EEG alpha rhythm and is reported to be very good at enhancing this rhythm.]experiences produced by the variety of techniques presented. Some of these techniques are dream-control techniques, in which the dreamer must recognize that he is dreaming and then convert the dream into an OOB experience. Others are what we might call hypnagogic experiences, for they involve fixedly holding the idea of having an OOB experience in mind while allowing oneself to drift into a hypnagogic or sleep state. Still other techniques seem to involve the creation of a "trance" state, but nothing further will be said about this third possibility here because writers use the term "trance" in very ambiguous ways, as will be discussed elsewhere (60). Miss Z's experiences may have been cases of hypnagogic phenomena following brief awakenings during the night, or of a Stage 1 dream being converted into an OOB experience. Which alternative is true is not clear from the exploratory work of this study.

The tentativeness of the correlations reported here between OOB experiences and brain wave states should be noted. The EEG is a complex phenomenon that varies in terms of frequency, regularity, waveshape, spatial distribution over the brain, and interareal phase relationships. The analyses reported in this paper were confined to visual inspection: adequate investigation of the possible EEG correlates of OOB experiences will have to use the most sophisticated recording and electronic analysis techniques, as well as running the selected subjects through control conditions to see which EEG correlates are unique to the OOB experience and which appear under other circumstances as well.

In summary, this brief study found a fairly clear-cut correlation between several of Miss Z's reported OOB experiences and a physiological pattern characterized by a flattened EEG with prominent alphoid activity, no REM or skin resistance activity, and normal heart rate. Much more work remains to be done before we can begin to understand the psychophysiological and parapsychological aspects of OOB experiences, and it is hoped that the present study, insofar as it has shown that these experiences can be studied by the techniques of modern science, will encourage other investigators to carry out further experiments.