

LEARN WHILE YOU SLEEP

The Theory and Practice of Sleep-Learning

By David Curtis

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MANUFACTURED IN THE UNITED STATES OF AMERICA
Library of Congress Catalog Card No. 60-15692
LIBRA PUBLISHERS, INC.
445 West 23rd Street New York 11, N.Y.

To the wife who, for these many years, has shared me with a pillow speaker. Thanks Elly. --D.C.

FOREWORD

"For now we see through a glass, darkly; but then face to face."

Such, I have found, are the processes of general education. Frequently, in my course on World Cultures, I have been able to gain my students' interest by demonstrating the truth of these ancient words quite literally. I ask them to look out the window and watch the cars in the street. Then I tell them to refocus their eyes and look at the glass only, and they invariably notice that it is not very clean. Possibly they were aware as soon as they entered the classroom that the windows needed washing; perhaps all they were conscious of was that the room had windows.

In any case many different things present themselves to the eyes and minds of students at the same time, and the good teacher knows how to channel their attention to a few specifics. Once he has done this he must remember the importance of repetition, for in the combination of repetition and attention lies the heart of learning. Further, he knows that repetition by rote is valueless unless the material is accurately absorbed in the beginning. Only correct practice makes perfect. Whenever I make an assignment I am careful to enter it in my plan book. I have learned from experience that some students will prepare the wrong assignment because they were only half listening, or because they copied it from the board incorrectly. And, of course, they never understand how they happened to make the mistake.

Occasionally I record lectures on tape and play them back. Students tell me that they hear things on the tape that they had not heard during the original lecture. And later on, at quiz time, someone will ask if I ever mentioned a particular point. Once again I expose him to the tape, and he is amazed that he never remembered any reference to the subject before. I explain to him that his mind must have been somewhere else during those words, not because of any deliberate inattention, but for purely unconscious reasons.

A teacher is forever trying out new ways of keeping his students' interest, or of attracting it when it is absent. If only he could hold the attention of every member of the class! Even though they may all be looking directly at the instructor, there are always a few who wander off momentarily, daydreaming without even knowing it. But I have found that this seldom happens when I give private instruction. I have no problem when the student is directly in front of me. The problem appears when he leaves me, for I have no control over his home life, where he may be disturbed by television, radio, or countless other annoyances while studying or reviewing his work. No matter how close I came to solving the problem I could never quite put my finger on the best method of improving the process of learning. It was only when I read the galley proofs of *Learn While You Sleep* that it became clear to me.

I remembered G.I.'s on a ship in the South Pacific, heading for New Guinea. They played records over and over again in order to learn the native tongue. One evening I was surprised to see friends in Message Center sleeping with earphones on, and this group learned the language most rapidly, impressing the officer in charge. Others, who spent their evenings smoking, chatting, gambling, or writing letters, said they had no time for extra study, and were told by a member of the advanced group what the secret was.

"The truth is," he explained, "I study during the day just as you do, but each day I learn more than you, because I've broken the barrier-I know the elementary words and phrases-and now it's fun to hear the next lesson. But still, after I've written my letters and relaxed, just before I go to bed, I put the earphones on and listen once more to what I heard during the day. With the earphones on I find I block out all disturbances and discover myself in a new world of learning. When I awake, most of what I heard is part of my new language."

This stayed with me. I thought about the idea often, but I never got around to trying it out or examining its worth. Now this has been done for me, in *Learn While You Sleep*.

I recalled another incident out of the past while reading this illuminating book. I was in Gouda, Holland, confined for several days in the Diaconnessan de Wyck Hospital, and not allowed to use my eyes. The nurse came over and handed me a little rectangular sponge rubber object, about four or five inches long, to which a cord was attached. She explained that there was a little speaker in the sponge rubber, and if I wished I could put the instrument under my pillow and listen to music for relaxation. The speaker's volume was very low, so low that at first I heard nothing. But when I turned my ear to the pillow I heard everything plainly. Since I was an American, the nurse tuned in the BBC for me.

The curtains were drawn all day so that I would not be tempted to use my eyes. When I closed my eyes and listened on the BBC to the news of England, my memories were re-awakened. London was mentioned, and I saw myself walking through all the areas I had visited in that cosmopolitan city. With these memories in mind I dozed off. When I awoke I remembered things about London of which I was not conscious before I fell asleep, and I realized that I hadn't dreamed these new memories, even though I saw vivid pictures in my sleep. These were pictures I had previously viewed while walking the streets from Marble Arch to Piccadilly Square, only a few weeks earlier.

As everyone knows, it is not possible to see everything in London in the course of one walk, but always, with each succeeding walk, I was surprised to note that I had passed various sights the day before without realizing consciously that I had seen them the first time. Now, with the little speaker under my pillow setting the stage for me, I found myself recalling myriad things about London, things which, only a few moments earlier, I did not believe I had seen!

This was a new and startling experience for me. As an educator I wanted to follow through on it, and investigate this process of learning while sleeping. But my time was taken up with many other activities-traveling, setting up new courses in World Cultures, trying to understand students with normal I.Q.'s who repeatedly failed in all subjects but one. I was experimenting in these fields, and was unable to turn my attention to this fascinating business of absorbing knowledge while asleep.

Learn While You Sleep reports concisely (but fully) the views of the great scholars of the past and present on this subject. Their conclusions about methods of learning, about memory, and about the role of the unconscious in the process of learning and recall are summarized and considered in relation to this approach which I call "learning plus." The idea of learning in one's sleep is not new. But because our modern world offers so many ingenious devices educators are

able, for the first time, to help their students learn more effectively. Valuable time can be saved, freeing the student (and here I use the word student in its broadest sense) for more advanced thought and further study in related fields.

Educators have never found any one method equally effective for all people. Some students never learned to spell until Fernald discovered her unique system. In any subject, some grasp more quickly than others. Similarly, some will learn more rapidly than others when using mechanical sleep-learning devices. But certainly most people should be helped.

If we are to get the most out of life, if we are to make human endeavor meaningful and satisfying, the importance of learning cannot be overemphasized. With the availability of sleep-learning equipment a new world has been opened up to both educators and students. The increased capacity for experiencing and remembering which it offers sparks the imagination and excites greater interest in learning than ever before. I am sure many readers will find the thoughtful and objective evaluation in *Learn While You Sleep* both interesting and provocative—as I did.

-Woodman E. Hupltts, Jr., D.Ed.

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CHAPTER I

WHAT IS SLEEP-LEARNING?

Students have always pored over their books far into the night, hard-working and conscientious in their pursuit of learning.

Today it is possible to be equally conscientious without working nearly so hard. It is, in fact, possible to sleep on the subject-quite literally-and learn it faster and more thoroughly than the most determined application allowed in the past.

This new aid to education is called sleep-learning.

Sleep-learning, a very young science, is based on the receptivity of the subconscious to suggestion and instruction during the sleeping period.

Its principles were known to the ancients. In Egypt, priests recited the scriptures to sleeping novitiates in specially built slumber temples, believing that this method would hasten the learning process. In both Egypt and Greece, people brought their problems to such temples. There, priests whispered helpful suggestions in their ears while they slept. The nocturnal advice dealt with matters of health, general living and the encouragement of confidence.

In informal ways we have been applying the principle of sleep-learning all along. We often decide to "sleep on" a problem we have been unable to solve and awake with the answer. While we are asleep, some watchful part of us prevents us from rolling out of bed, or pulls the covers up when they have slipped. Mothers who sleep through traffic noises, thunderstorms and husbands' snoring awake at the slightest sound from their babies. The subconscious functions while we sleep and it has been proven that it can be directed into channels of our choice. In 1932, Aldous Huxley envisioned a new world in which hypnopaedia (sleep-teaching) would be used for purposes of conditioning future citizens along lines considered useful for the state, rather than for intellectual improvement.

The methods Huxley described are almost identical with those now in use. He speaks of a continuous, repetitious whisper under the pillow. The degree of his prophetic talent is apparent to people familiar with sleep-learning equipment, in which a pillow-speaker is attached to a clock-controlled phonograph or tape-recorder. The speaker's volume is just loud enough to reach only the ear of the sleep-learner and the material is repeated several times during the night.

More than a quarter of a century later, in *Brave New World Revisited*, Huxley discussed the facts then known about hypnopaedia. He was concerned about the possibility of misuse but, at the same time, recognized that factual material was being taught successfully to sleeping people.

Responsible proponents of sleep-learning point out that the same possibility exists in many scientific fields, but that this risk should not keep us from making use of the beneficial aspects of this new technique.

The Sleep-Learning Research Association's statement of policy reads in part:

Because we have reported what some are doing in this field, in no way do we mean to imply that sleep-therapy (induced auto-suggestion by the sleep-learning method) is a substitute for medical or psychiatric treatment. Moreover, because some people are not susceptible to suggestion (science says 10% are not), we cannot specifically guarantee that your attempt in sleep-learning will be successful, should you try it. What nocturnal education will do in the future, when all its implications will be realized and exploited, we cannot yet say. . . .

The Association further writes that it finds, despite "a certain amount of hocus pocus," it cannot scoff at the results of the do-it-yourself psychology known as sleep-therapy in view of the many letters attesting astonishing improvement.

Though there is comparatively little factual material available on the subject, research is being carried on to test the theory that one can learn while asleep. Notable among the studies whose findings have led to worldwide experimentation are the work at the University of North Carolina, the University of California, William and Mary, Parsons Training School, U.C.L.A., Georgetown University and the Institute of Logopedics.

There is considerable interest in some medical circles about the pain-reducing or pain-eliminating faculties of sleep-suggestion.

It is known that childbirth has been rendered painless this way. Indeed, in 1951, the Soviet Union passed a law making it compulsory for doctors to use this method on every mother-to-be. Although many doctors still question sleep-learning, there are a growing number who, after investigation, are beginning to apply its principles.

Psychiatrists have evinced particular interest in its potential value in therapy. A May, 1960, article in a leading New York newspaper reported on a paper presented to the Scientific Session of the American Psychiatric Association in Atlantic City by Dr. M. Ralph Kaufman, of the Mount Sinai Hospital, which stated:

The situation at present is such that psychoanalysis that began as hypnotherapy . . . has now given us the kind of understanding of hypnotic suggestion which again makes it available as a therapeutic measure for psychotherapy.

Sleep-learning advocates claim that at least 8,000 college students supplement their daytime work with sleep-study. Testimonials from high school and college students indicate better results in examinations resulting from their use of sleep-learning techniques. Language instructors as well as their students report that this method of study speeds up the learning process considerably.

A mid-Western lecturer states that his memorization rate increased by 75%."

A blind student finds the technique uniquely helpful and practical.

Parents write that young children, whose studies involve a considerable amount of rote-learning, benefit greatly.

The memory training qualities of this technique seem to be of particular value to people who must remember specialized data. Television presented to the American public a young man who learned conversational French while asleep, under controlled test conditions. After only one week of sleep-learning, he was examined by Dr. Adrian Miller, Professor of Romance Languages at U.C.L.A., on the television program, "You Asked For It." The professor's judgment was that the young man had absorbed the equivalent of a SEMESTER of classroom study.

Others report considerable help in the learning or appreciation of music. Television actors, among them Larry Blyden and Marilyn Erskine, have learned complete roles quickly with the aid of sleep-learning equipment. Chilean opera star Ramon Vinay not only quickly memorized a leading operatic role but also learned to sing it in perfect, accentless Italian. Equally successful results have been reported by people of various language backgrounds in learning English, again free from foreign accent.

At the Institute of Logopedics, in Wichita, Kansas, where experiments were conducted to find out whether nocturnal education could help cure speech defects, the results showed that students who heard a list of words while they were sleeping memorized and improved much faster than the control group which did not apply sleep-learning.

Numerous famous personalities have attested to the benefits of sleep-study. Alexander de Seversky eliminated his Russian accent. Rudy Vallee, Bing Crosby and Gloria Swanson have learned lines and lyrics in this way.

Perhaps the most impressive example of the retentive powers of the subconscious during sleep is that of Art Linkletter, radio and television star. Linkletter offered to test the theory by attempting to sleep-learn the most difficult language in the world-Mandarin Chinese. After sleep-studying for only ten nights, Linkletter invited the Vice Consul of China to his TV show, introduced him to the audience, and then proceeded to engage in a pleasant conversation with his guest in Mandarin Chinese. The Vice Consul's verdict was that Linkletter was indeed conversant in the language and would be able to travel throughout China and be understood perfectly by anyone who speaks the elegant Mandarin dialect.

It is now known that during World War II, members of the armed forces of the United States were taught the Morse Code and foreign languages, in a necessarily brief period, with the aid of sleep-learning. The renowned Office of Strategic Services (O.S.S.) taught its agents not only languages but also accents, slang and custom of the countries to be infiltrated. They learned quickly and thoroughly.

An oil company in Arabia employs sleep-learning for teaching English to its native employees and Arabic to its American staff.

In 1955, Canada's Department of National Defense used sleep-learning in the training of Royal Canadian Air Force personnel. These men scored consistently higher than a control group of non-users.

Business has been quick to recognize how sleep-learning can help build up sales. The Wall Street Journal of March 14, 1958, reported on a group of corporations using sleep-learning self-confidence-development sales courses to bolster the effectiveness of their salesmen.

This approach has also proved invaluable to many who must remember special technical facts or figures. A railroad dispatcher memorized the entire passenger train schedule of the Union Pacific Railroad in 10 days. A post office employee memorized the postal zones of 16,000 streets. A television announcer memorized commercials accurately and quickly and remembered them at will while on the air. A production executive in a large advertising firm memorized nearly 600 telephone numbers of frequent usage.

Unusual and successful experiments in sleep-teaching are reported by a professor who taught Greek to his five-year-old child by whispering in his ear as he slept; by a pastor whose eleven-year-old son memorized four pages of poetry overnight (while the rest of his class learned two pages in a week); by a man who taught his parakeet 1,300 words; by a 63-year-old grandmother who is memorizing the New Testament; by a writer who is memorizing the dictionary at the rate of three pages a night.

Psychotherapists submit favorable reports on the use of sleep-teaching techniques for implanting therapeutic suggestions in the subconscious mind to supplement treatment during waking hours. "There appears to be enough evidence to indicate that treatment during sleep is not only possible in theory but also effective in practice," writes Dr. Ernst Schmid-hofer, chief of the Neuropsychiatric Service of the Memphis Veteran's Administration Hospital.

Psychologists have also reported success in breaking bad habits ranging from over-eating to speech defects. Mothers, following their suggestions, have been able to train their children out of thumb sucking, bed wetting and nail biting through the use of sleep recordings.

Since certain diseases and mental disorders are the psychosomatic symptoms of a subconscious block, it is felt that the inner conflict must be recognized and faced consciously by the patient in order to overcome the problem. Since suggestion is the tool of psychotherapy, it must be concluded that pre-recorded therapeutic messages (sleep tapes) can take their rightful place beside drugs and hypnosis as an effective device for reaching the subconscious.

Certainly the cases reported indicate that there is a great value potential in this form of therapy. It has been stated that sleep-suggestion may eventually replace hypnosis medically, since doctors and psychiatrists can make a tape more easily than they can apply direct hypnosis. The Sleep-Learning Research Association reports some experiences of a Florida doctor in which response to this form of therapy resulted in a cure:

- A man who lost his voice at the age of fourteen, due only to psychological causes. For twenty-six years he could barely whisper. After sleep therapy, he recovered full use of his voice.
- A girl who suffered a nervous breakdown. She was a conscientious worker in the field of religion. Frustration in her work had led to the breakdown. Several weeks of sleep-therapy restored her to a normal, busy and happy life.

- A minister who had to give up his work because of a series of nervous breakdowns. After applying sleep-therapy he found his former capacities restored and he was able to return to work.

Other successfully resolved cases included a chronic stutterer, an insomniac, an alcoholic and a case of loss of hearing.

This doctor was particularly interested in a reaction common to patients using sleep-tapes which psychiatrists refer to as "ventilation." He feels it is a remarkable discovery which has answered many questions for him.

"After using the tapes nightly for a time," he writes, "hidden complexes and causes of tension are brought to the surface. Temporarily, one feels worse than ever, but after a few hours, the patient recovers and these feelings do not return. They have been Ventilated/ This is a method for applying mental catharsis, which, in my judgment, is better than the old method of 'talking it out/ "I have had several such problems myself, which, upon analysis, were ventilated and did not return. I liken this to pouring clean water continually from a hose into a barrel of bad water. In time, the bad water is brought to the surface where it is disposed of and replaced by good, clean water.

"For, just as the subconscious can and will answer back with what it contains," concludes the doctor, "so the continuous pumping into the subconscious of powerful, positive suggestions will bring a like response after the hidden and negative complexes are removed by Ventilation/ " What does all this mean to laymen?

CHAPTER II

THE LOGIC OF SLEEP-LEARNING

Why is the conscious mind unable to absorb facts as quickly as the subconscious? How can we explain the case related by Samuel Taylor Coleridge, of the twenty-five-year-old woman who could not read or write but who, during a seizure of what was then known as brain fever, spoke Latin, Greek and Hebrew incessantly and in very pompous tones—even knowing she had been a servant to a Protestant pastor for many years? She had subconsciously absorbed the passages he read aloud to himself as he walked up and down a hallway adjoining the kitchen. Notes taken during her delirium coincided with passages in books which the pastor owned.

Authorities on hypnotism have pointed out that most of our thinking is done subconsciously. Our conscious minds are aware only of the results of this thinking. This is what happens when we give up trying to remember a particular thing and then find the answer the next day. Repetition of acts, which are learned consciously and, with difficulty, are executed very slowly at first (walking for instance), makes these acts easier to perform, until finally the effort involved becomes less than the minimum necessary for consciousness. The rapidity and dexterity with which we perform many actions, make us unconscious of these actions. This same ease and speed, the sleep-learning people feel, is attainable in many areas of mental training.

Much of our knowledge lies beneath the surface of our consciousness, ready to be recalled when the need arises. It would be impossible for us to function if everything in the mind were always present in our awareness. Selectivity and concentration would be seriously hampered by the distraction of too many ideas, for our brains record every impression, every thought we ever had, every action we have performed. This record is permanent, and affects us all our lives. It remains in the subconscious, ready to be associated with a conscious idea, in a process of which we are completely unaware. Consciously we may forget a great deal, but all the memories, all the ideational and imaginative capacities, are there in our subconscious. They flash into our conscious minds suddenly and without effort or we are able to remember them consciously by association.

This subconscious selectivity of material for our conscious minds is the key to concentration of attention, during which we absorb consciously that which we have focused on, but exclude all other impressions of our senses. We exclude them, that is, from our consciousness, but the subconscious will notice and absorb them. The subconscious is able to supply the information when it is needed, if the necessary conditions of relaxation and receptivity are present.

Relaxation and receptivity to suggestion are the principles behind sleep-learning. They make it possible for subjects to perform feats impossible for them during conditions of consciousness. The retentive power of the subconscious accounts for people carrying out post-hypnotic suggestions. It is these same principles of relaxation and receptivity to suggestion (suggestion concentrates the attention of the subconscious), on which sleep-learning is based.

The reticular theory of consciousness, a new explanation of how the brain works, puts forth the hypothesis that the nerve cells performing the highest level of integration are deep within the

brain, not in the outer layer, or cortex. This inner system is known as the reticular system, and the theory is that the cortex gives meaning to the incoming stimuli and stores these meanings for future reference. The cortex also condenses, edits and transmits the sense stimuli to the reticular system for final integration into meaning. Then the reticular system sends out impulses to sensori-motor regions of the cortex which will induce a muscular response.

According to this theory it is not only the cortex, but also the midbrain (subconscious) which can store patterns of learned behavior. The cortex plays an important role in the learning of motor activity, but in time this is bypassed and the reticular system and the subcortical motor centers take over most of the work. The electro-encephalograph, a machine which records brain activity, has shown us that the subconscious is receptive and alert twenty-four hours a day, and has established proof that the subconscious mind can absorb for that full period.

Proceeding from this knowledge, sleep-learning authorities base their approach on the fact that the sub-conscious receives and retains all stimuli regardless of whether the subject is awake or asleep. Similarities have been noted between some stages of hypnosis and normal sleep, in that the same influences can bring about either state. Elimination of strong stimuli, a position of rest, gentle, monotonous stimulation of the sense organs, dismissal of disturbing thoughts—all these, added to the subjects' passivity, have been accepted as proven methods for putting people to sleep, either naturally or hypnotically. The influence of suggestion has operated not only on people in a hypnotic state, but on people in light sleep as well.

In dreams, we accept without question many things which our conscious minds would reject, as do people under hypnosis. It has been found that the subject remembers more of the suggestions made to him in light hypnotic sleep; it has also been found that the dreams we remember are those that occur during light sleep, during which people have been known to converse logically without being conscious of their participation. This is referred to as the 'Reverie Period' and is of particular importance in sleep-learning.

Most people are susceptible to suggestion in their waking hours, susceptible to a much higher degree than they realize. In every life situation, we are exposed to many subtle suggestions, all of which influence us. We catch moods, we yawn involuntarily when we see another yawn, we pick up rhythms, we respond to ideas under the influence of charm, affection, and numerous other feelings, we accept much on faith in fields other than our own, we are influenced by books, clothing, atmosphere, words. We are educated by suggestion, to a great extent, and receive moral and religious instruction in the same way. In time we develop a large body of autosuggestions. It is because of our suggestibility that we respond to the arts, that we buy what we buy, responding to the advertiser's repetitions. Suggestibility in the voter becomes evident at the polls. Broad social movements and mob action could never occur if it were not for the fact that most human beings are highly suggestible.

It is in a relaxed state—or any other state in which the reasoning function is less active, that we are most amenable to suggestion, and this fact appears to be responsible for the efficiency in learning that is claimed by adherents of the sleep-study school. Relaxation increases with sleep, and so the subconscious is even more easily reached by suggestion than it is during waking hours, and is taught more effectively. "Suggestion," says Professor Bechterev, "enters into the understanding

by the back stairs, while logical persuasion knocks at the front door." Sleep-learning, then, since it is predicated on suggestion, avoids the necessity of waiting for the conscious mind to open the door for the desired information. It slips in more easily, unhindered, because the door to the subconscious is always open.

During sleep, during periods of relaxation, during hypnosis, mental stress is at a minimum. Since learning is most easily absorbed under favorable emotional conditions, and since the mind is so receptive to suggestions under these conditions, sleep-learning reflects the benefits of many advantages not always possible during waking hours. It is no longer necessary to make a conscious effort to concentrate, to eliminate distracting thoughts, or to call up the will to learn. The procedure, as described, is to begin listening to the recording before falling asleep, during the beginning stages of Reverie (the light sleep period). The first thing heard is "relaxation affirmations," designed to help prepare the subconscious for the proper degree of receptivity after falling asleep.

This pre-sleep relaxation is considered especially important during the first few weeks of sleep-study sessions, for the new student must often overcome the tension and nervousness attendant on a novel and exciting experience. For some, there is no difficulty at any time, but many beginners, eager for success and keyed up in anticipation and foreknowledge of what is to happen, awake at the sound of the recorded voice- in many cases even a moment ahead of time. This problem is usually overcome in a few nights.

The next stage is described as the most trying period, the period during which the 'original barrier*' must be overcome. This is the resistance to sleep-learning, which can be eliminated by gradual conditioning of the subconscious to be receptive to audible directed sound. Once this is achieved, the barrier had never been known to reappear, and material can be easily learned in a few nights, in many cases in a few hours.

The length of time it takes to overcome the barrier varies from student to student, but tests have proven that complete reception begins within fifteen to thirty nights after the initial attempt. If this does not happen, the barrier must then be overcome by using a tape with a positive affirmation for sleep-learning in order to remove the psychological block.

The importance of relaxation affirmations is stressed because of the tensions and frustrations that are a part of our life, and which can be at work even during sleep. Other recommendations for getting through the barrier stage include:

- Conscientiousness and genuine desire to succeed.
- Consistency of sleep-study-without even a night's interruption, if possible.
- Short messages at the beginning; using a poem for the first learning attempt, since the alliteration and rhythm seems to be conducive to early reception.
- Avoidance of alcohol, drugs, barbiturates, or tranquil-izers, which induce a heavy, unnatural sleep.
- Confidence and overcoming of anxiety.
- Delay of study, instead using sleep-therapy affirmations during illness and recuperation.

- Alternating self-development recordings and material to be learned, to remove tensions and negative thoughts, build up self-confidence, and develop relaxation.
- Keeping mechanical noise to a minimum.

If the barrier appears to be impenetrable, special sleep-therapy tapes are available.

It is strongly recommended that, at the beginning, only the Reverie Periods should be used for sleep-learning. Reverie is described as the state of drowsiness between waking and dreaming which begins just before falling asleep, and which recurs about one hour before awakening. It is during this state, psychologists have found, that the subconscious is most receptive.

Once reception has been definitely established, the student may start using the Transitional Sleep Period, which usually begins three hours and forty minutes after falling asleep. This is the transition between the third and fourth (the deepest) stage of sleep, and material received by the subconscious during this transitional period is remembered most rapidly of all. The explanation for this is not known.

Specialists in sleep-learning are unable to state with certainty how long it will take to absorb a message in sleep-study. They do know that for most people the number of impressions (repetitions) necessary to memorize material during sleep is most certainly a great deal less than the number needed while awake.

The experiments of Dr. Wilder Penfield of the Montreal Neurological Institute established that the natural tape recorders in our heads require only one impression for retention-possibly lifelong. Dr. Penfield discovered this during surgery on patients under local anaesthesia. He stimulated certain brain cells with gentle electric current and the patients, who were conscious, reported perfect playbacks of conversations, songs, and other experiences as far back as childhood. This is considered by sleep-learning researchers to be potentially meaningful in yielding explanations of reports that students awakened between two and five o'clock in the morning received an entirely different message from the one they had put on tape.

Despite the knowledge that one impression is sufficient to register permanently on our brain, repetition appears to be necessary to memorize material. The reason for this is not yet known. It is thought that there may be some relationship between the time the impression is made and the ability to recall it when awake. Sleep-learning psychologists hope to discover a means of triggering off recall of material, possibly an associational symbol which will stimulate the recall much as the electric current did in Dr. Penfield's experiments. Meanwhile, sleep-memorization is based on repetition and free-association.

Certain things have been found to be helpful in aiding retention of material. Motivation is important, as, for instance, thinking of the reward that will be enjoyed as a result of learning. Material that is understood is retained better than material learned by rote alone; repetition alone will affect memorization, but retention for any length of time requires the use of intelligence. Writing the material after learning it tends to shorten the time necessary for permanent learning, and repetition a few times after the material is learned aids in retention. New forms of

presentation are no more effective than repetition of identical material; the latter is recommended to refresh the memory.

The order of presentation seems to be important: the beginning and end of a lengthy sleep-study period are often better remembered than the middle parts, which seems an emphasis that the student should not attempt absorbing too much material in one night's sleep-study.

In learning a language it appears more effective to place the English word ahead of the foreign word. New, challenging, interesting material is easier to retain than dull, static, or uninteresting data. Frequently something that seems unavailable for recall (like every one of 1000 new words), will be recognized and understood when the student is confronted with the necessity for recognition.

It is not advisable to try to learn two unrelated subjects in one night; the second subject can diminish or cancel out the first in what sleep-learning psychologists call retroactive inhibition. Good results in sleep-learning lead to still better results in sleep-learning.

It is not surprising that this discovery has also been channeled into the do-it-yourself movement so popular today. Sleep-therapy can now be purchased on a self-development basis. Recordings leading to 'complete mind power' and 'personality integration*' are on the market.

A radio and TV psychologist, offers a course of ten nocturnal messages for success, and finds that subconscious acceptance of suggestions of positive ideas outdistances positive thinking on a conscious level by far. He says the fundamental concept is that you are what you think you are, and sleep-suggestion can make you think of yourself as you would really like to be; then you awake and act accordingly, having, through sleep-therapy, changed your idea of yourself.

He offers a great deal of evidence, among which is a case history of an unhappy draftsman who, after years of dissatisfaction, switched to selling and earned more in a week than in three months at his former job.

Another example is the case of the woman whose shyness amounted to terror, but subsequently became chairman of an important organization.

Self-development recordings for weight reduction, deep relaxation, physical well-being, memory power, will power, magnetic personality, self-confidence, vitality, elimination of insomnia, financial success, self-mastery and creative inspiration; these are but a sample. Also available is an excellent series of 'Self-improvement Through Hypnosis' recordings. The basis of them all is the sincere conviction that you are what you think you are. Positive thinking subconsciously impressed into your mind is the same method used to impress technical information, poetry or any other material.

Following is a sample taken from one of these self-help recordings, spoken slowly and with a minimum of inflection by a deep, sonorous voice:

. . . suggestion is the golden key which unlocks the hidden depths of my subconscious mind and releases its strength and power. I am determined to use this strength wisely to produce only beneficial results. Consequently, from this moment forward, I positively will think positively and act positively, so that all my thoughts and feelings will press my subconscious mind to greater and greater positive results. I visualize myself as a dynamic positive person. I feel life within me, vital, sure and strong. My reaction to my environment is natural and positive. Dynamic life courses through me and manifests itself in my optimism.

My life is a stimulating challenge. A joyous, golden opportunity to live greatly, live abundantly, and to achieve magnificently. . . .

The power of suggestion on these recordings has worked repeatedly, judging from the numerous testimonials. People write that they have been conditioned to give up smoking, overcome irrational dislikes which hampered them, converse more effectively (and make more money), relax, make decisions, eliminate worry and tensions, sleep better, develop placidity and optimism, enthusiasm, faith and energy. Nonetheless, users are warned that the Voice in the night' recordings are not intended to be a substitute for psychiatric or psychological assistance or medical treatment.

One such statement goes on to say: "They are designed to help the man and woman in our society whose schedule is so exacting that little time is left for relaxation of study. It is intended to assist the individual in his quest for inner tranquility and peace of mind. It is designed for the person who seeks to gain confidence in himself and in his love for life's adventures."

Parents, it appears, can be aided in raising their children by the use of recordings especially designed for them-recordings which will teach the children self-confidence, memory power, personality development, the desire to learn, the ability to read, obedience, unselfishness, neatness, good manners; recordings which will help cure them of bed-wetting, nail biting, fears and apprehensions, eating problems, stealing and lying.

"Your fingernails taste bitter. Your fingernails taste bitter," the recording repeats. Apparently many of the sleeping children become convinced, find their fingernails do taste bitter, and drop the habit. A California pediatrician reports success in as high as 70% of cases in the last twelve years where he has had parents talk to children with bed-wetting problems while they were asleep-and this after only two or three nights' repetition. Today's electronic equipment, of course, saves the lung power of the parent while achieving the same results.

Therapy combined with sleep has been reported effective in connection with special problems and social betterment. Dr. James Odell, Coordinator of Adjunctive Therapies at the Parsons, Kansas, training school, conducted an experiment with retarded and mentally disturbed children. He selected two young girls with an I.Q. of twenty-five and forty respectively, who had difficulty pronouncing the letter "R." He played a sleep-tape for them on which were various words containing the letter "R." This, combined with speech therapy sessions, resulted in the children using the letter "R" correctly after twenty-one days.

Adults whose problems have landed them in prison have voluntarily participated in a sleep-therapy experiment in the Woodlake Road Camp near Visalia, California, in Tulare County. The tape message is based on the belief that a desire for self-punishment is the main reason for crime, and is intended to overcome this desire.

A recording played at specific intervals during the night drones, "Sleep, sleep, you are now completely in sleep. Listen, my inner self. Remember and obey this creed of life. Live. Relax. Completely and utterly relax. Heal my soul. Unite my subconscious with my conscious life. Life is worth living, worth living wholeheartedly. Love rule my life. Love God, family, others. Do to others what I want them to do to me . . ."

Another report of this experiment substitutes "you" for the first person, and continues, "You shall have a major goal in life. You shall plan, carry out and attain that goal. You shall work and share with others. You shall grow in mind and spirit. You will attain self-respect and maturity because you are good . . . you will live without alcohol. Alcohol is poison. You do not need alcohol. You can abstain from alcohol. Alcohol is repulsive to you . . ."

John Locke, public defender of Tulare County, feels that there has been about 50% effectiveness so far, but adds that the test should continue for four or five years before fully assessing results. Some of the prisoners reported benefits. One said he always dreamed of liquor, but after sleep-therapy liquor made him sick to his stomach. Another announced a new belief that people were not "down on him." A third said he could now go to sleep with a clear mind. The Tulare County Board of Supervisors have made "Operation Sleep" a permanent fixture.

Aldous Huxley objects, not to the principle of filling people with love and compassion, but to the principle of sleep-teaching by government agencies. He questions whether the treatment would always be on a voluntary basis, and whether the intentions would always be as good as they are in Tulare County.

Despite his concern over possible abuse of power and the resultant threat to freedom, he willingly attests to having seen some remarkable results and concludes that hypnopaedia, or sleep-learning actually works. The period of sleep during which the actual study best reached the mind still eludes him, since there may be a technical question as to whether the learning takes place during sleep or during a special kind of waking state which the subject does not remember. (This probably is what the sleep-learning psychologists refer to as Reverie.) What Mr. Huxley is concerned about is the would-be dictators and mind manipulators.

Undoubtedly caution should be exercised. The Federal Trade Commission is keeping close watch. However, most sleep-learning people are sincere in their claims, with honest stipulations as to the actual merits of sleep-study and therapy. Certainly, it is to be understood that the ability to learn, either consciously or through sleep-study varies from person to person.

Age is no barrier to sleep-learning, if the student is conscientious in application, and in reasonably good health (in order that the mental block of bad health should not interfere with the processes of learning). There have been many tests that determine positively that people of any age can learn by this method.

It should also be logically assumed that using sleep-therapy for the removal of pain should not be attempted without the advice of a competent medical authority.

The practice of sleep-study has not, as far as is known, produced any harmful effects and, when proper instruction procedures are followed, it is extremely unlikely that any harm could develop. The method is used widely in secondary schools in Soviet Russia, as well as in the treatment of the mentally ill, and even more extensively in other fields of medicine. There, the treatment is based on Pavlov's discoveries. Most certainly the progress of sleep-learning can be raised, because everyone possesses an infinite capacity to learn; this, combined with sleep-learning will produce this result, just as a relatively high I.Q. can fall if the brain stagnates through inactivity. In this country, interest has been growing steadily, as are sales among manufacturers of equipment and recordings.

It is fairly safe to assume that both will continue to grow. Certainly great strides have been made since the psychophone was marketed in 1920 for sleep-teaching. (This was a spring driven device that required winding by hand and was soon shown to be ineffective for extensive research.) The advances made by the electronic industry offer advanced equipment and recordings, noiseless and trouble free, that will further the actions and develop to an increasingly greater degree, the technique of sleep learning.

Certainly the science of making useful the third of our lives normally spent in sleep, is worth investigating.

CHAPTER III

THE SUBCONSCIOUS

Since sleep-learning is based largely on the capacity of the subconscious to absorb and retain information, let us investigate the knowledge and theories existing about this less familiar area of the brain.

It should be noted that the term subconscious is used in sleep-learning and in literature about hypnosis, but the term is not recognized in psychoanalysis. The term used in the latter is the unconscious. When referred to in sleep-learning, however, it is the subconscious. Remember, there is no area of difference between the terms.

In Freud's imagery, the unconscious was a kind of anteroom to the conscious mind, from which excitations are frequently barred by a censorious doorman. This censor is referred to as repression. But, sometimes, these excitations from the unconscious pass the censor without becoming conscious. That is, they are held back by further resistance. This, Freud referred to as the pre-conscious system. These unconscious processes can be quite powerful and can produce effects and ideas without the conscious mind being aware of the processes involved.

"Unconsciousness" wrote Freud, "is a regular and inevitable phase in the process constituting our mental activity; every mental act begins as an unconscious one, and it may remain so or go on developing into consciousness, according to whether it meets resistance or not."

We are all familiar with the overnight solving of a problem unresolved before sleeping. This is consistent with Freud's comments on nocturnal mental activity in his study of dream processes. He tells us that "unsolved problems, harassing cares, and overwhelming impressions continue the activity of our thoughts even during sleep, maintaining psychic processes in the system which we have termed the preconscious.

"The thought-impulses continued into sleep may be divided into the following groups:

1. Those which have been left uncompleted because our mental powers have failed us, i.e., unsolved problems.
2. Those which have been suppressed and turned back during the day.
3. Those which have been excited in our Ucs. (unconscious) during the day by the working of the Pcs. (preconscious).
4. Those which have not been completed during the day owing to some accidental cause.
5. The indifferent impressions of the day, which have therefore been left unsettled."

Freud goes on to point out that preconscious activity will not become conscious mental processes during sleep. If this were to happen, then we would simply not be asleep.

While discussing unconscious activity in terms of the dream-process, Freud makes an interesting observation which may explain some aspects of the capacity to learn during sleep. He points out that dreams substitute for many daytime thoughts and once investigated and understood, fit

together with logic-indicating that the thoughts originate in normal mental life and that the complicated processes of conscious thinking are repeated in dream thoughts. He saw a continuous process from the first stimulus (often not consciously noted, but occurring during waking hours) to its completion at the onset of sleep.

Freud considered this proof that extremely complex mental operations were possible without the cooperation of consciousness.

Freud later made clear that the unconscious, preconscious, and conscious thought development was not a matter of psychic topography. Eventually he concluded that the essential character of a preconscious idea was its connection with the residue of verbal ideas. He asserted that consciousness was overestimated by the psychologists of his day, describing the unconscious as the larger circle which included the smaller circle of the conscious.

Further he wrote that everything conscious has a preliminary unconscious stage, although the reverse is not true. The unconscious, he said, is the "true psychic reality; in its inner nature it is just as much unknown to us as the reality of the external world, and it is just as imperfectly communicated to us by the data of consciousness as is the external world by the reports of our sense organs."

Intellectual achievement during sleep (completion of daytime mental work) is part of the same psychic forces operating intellectually during waking hours. Unconscious activity is related to the "inspiration" experienced by creative thinkers. There is in these moments a concerted effort of the unconscious becoming aware and joining with conscious activity.

Freud developed his concept of the unconscious, preconscious and conscious into the theory of a personality organization of the id, the ego and the super-ego. He did not consider the ego synonymous with consciousness, nor could he separate the preconscious and the unconscious completely, for they revealed certain characteristics in common. The general qualities of the original distinctions were retained, with the id representing the entirely unconscious aspect of mental activity, without organization or will or awareness of the passage of time; the ego is part of the id and is its agent, more affected by the external world, and the seat of intelligence and reason; and separating itself from the ego, in a self-observing and self-critical function, representing the demands of the external world, is the super-ego.

Jung believed that a knowledge greater than man's own lies in the depths of the unconscious. He felt that this knowledge is a collective psyche of the ages as well as the forgotten or unrecognized aspects of individual experience. He taught that the greater the harmony and coordination of the conscious and unconscious, the healthier the individual will be. He spoke of joint activity between the two. He also described the unconscious as continually active. The individual's direction is indicated by the combination of materials in the unconscious-ininitely superior to those in the conscious mind-and thus an "unparalleled guide" for mankind.

Jung based his ideas of the collective unconscious on the fact that motifs of myths and legends are repeated in identical forms all over the world. He recognized two layers in the unconscious, one personal and one trans-personal, the latter common to humanity. The personal memory-

images are filled out, because they have been experienced by the individual, but the collective layer, being pre-infantile-residues of ancestral life-and not personally experienced are therefore not filled out.

Jung felt that the unconscious was continually occupied in grouping and regrouping its contents, and normally, this activity is coordinated with the conscious mind in a compensatory relationship.

In discussing susceptibility and mental contagion, Jung spoke of man as having a great capacity for imitation. He notes that this is a double-edged capacity- valuable for collective purposes but dangerous from the point of view of developing the individual. Development of the individual involves the compensatory relationship between the conscious and the unconscious, which leads to a widened consciousness and a freer participation in the world.

Dollard and Miller believe that reinforcements of all kinds automatically strengthen responses that immediately precede them. They feel that the primary effect of a reinforcement is always unconscious-but that this unconscious reinforcement is mediated by verbal and other cue-producing responses. Over-learning can render responses unconscious and, as a result, verbalization can be short circuited. Thus automatic (unconscious) habits are formed. But because there was verbalization originally, it is fairly easy to recover the habits from the unconscious after over-learning. A strong drive will intensify the habitual response.

Dr. Bernard Hollander, a lifelong student and practitioner of hypnosis, writes that some psychologists do not accept the existence of the subconscious but, he points out, regardless of terminology or the degree of unconscious or subconscious activity, there obviously exists a large collection of experiences, thoughts and emotions not present in our consciousness at any given moment. He uses the term subconscious as a working hypothesis to explain the source of the genius' ideas, inspiration and creativity.

We are conscious only of the result of subconscious thinking, which he says, constitutes much of our thinking. The activity itself remains hidden from us. Many learned acts, by virtue of repetition, become subconscious. Selection of one out of many ideas stimulated by association, is a decisive activity of the subconscious. Associative sensory impressions, as we concentrate on a particular subject, are noted by the subconscious, even though we are not consciously aware of them.

Of course, subconscious work is not tiring, as is conscious effort.

Writing of the conscious use of the subconscious mind, Robert D. Updegraff notes that we drive ourselves consciously but use only half our minds. By not relaxing, we keep the subconscious from working for us. He points out, as does Dr. Hollander, that a majority of brilliant men reported that their best discoveries occurred to them when they were not working. Von Helmholtz never got his ideas when he was fatigued or at his work table. Thornton Wilder's inspirations came in the shower or on hikes or in other informal places. Descartes' discoveries came to him in bed in the morning.

Updegraff writes that we can consciously use the subconscious mind, first by organizing the material consciously, then by giving a definite assignment to the subconscious and forgetting it. The material can be written out, or simply discussed with associates, or worked on consciously until exhaustion sets in-and then put aside completely in favor of a relaxing activity or sleep. The subconscious mind will probably finish the job.

Sometimes further conscious work is necessary, but usually the subconscious can be trusted and often does the work more quickly than the conscious mind. Further, says Updegraff, the results are probably better by virtue of the fact that a whole life's experience is brought to bear on the problem.

An interesting footnote to habit-breaking comes from Knight Dunlap. He recommends practicing the bad habit: making the unconscious habit conscious by doing it intentionally, but denouncing the habit while practicing and also intending sincerely to break it. This 'negative practice,' was tested and found successful. Dunlap, himself, tried it out. He had a habit typing hte instead of the and practiced by typing hte hundreds of times, telling himself each time that he was wrong. The original error was unconscious; he broke the habit by making himself conscious of it.

Since the subconscious is the 'store house of memory and habit/ we can fill it during sleep with suggestions of our choice, which we retain better than conscious ideas because then interferences are absent. We know our conscious will accept whatever our subconscious accepts.

Since there is still much to be learned about the subconscious-unconscious, it is impossible to evaluate with certainty all sleep-learning claims. Among authorities, however, there is a high degree of acceptancy.

All the authorities whom we have discussed rated unconscious activity as much greater than the conscious. They believe that the unconscious never sleeps. Freud saw dreams as logical processes developed from conscious thought. Jung believed that the unconscious was constantly grouping and regrouping its material, and that harmony and coordination between the unconscious and conscious could be achieved to a greater degree, with infinitely more satisfactory results to the individual. In sleep-learning, too, the assumption is made that the subconscious has a capacity for assorting, selecting and arranging material and that the danger of universal conformity can be allayed by conscious interpretation of the unconsciously learned material.

Dollard and Miller's discussion of overlearning can be directly related to sleep-learning. Reinforcement is an important part of sleep-learning and daytime recall can perhaps be explained in terms of cue-producing responses. Sleep-learning is verbal and should be considered as an important new aspect of the thought process.

Dr. Hollander's description of subconscious activity comes closest to explaining the process by which we learn in our sleep. Ideas are suggested to the subconscious, which absorbs them and supplies them to the conscious when they are needed, by its own mysterious process of selection. Repetition renders many learned acts unconscious and these are always accessible to us -barring repressive disturbances.

Updegraff attests that the subconscious can be put to use consciously and deliberately. Sleep-learners simply go one step further.

Sleep-learners' experience in breaking habits indicates that Dunlap's time-effort-consuming approach to negative practice is unnecessary self-punishment.

The power of the subconscious can apparently be harnessed through sleep-learning.

CHAPTER IV

THEORIES OF LEARNING

How do we learn?

Theories have been expounded through the ages in attempts to explain the process of acquiring knowledge. The ancients formed theories consistent with their philosophies and in terms of their particular culture. More recent thinkers tried to veer away from the completely abstract interpretations in favor of answers which could be better related to tangible evidence. Modern psychologists have been concerned with establishing a physiological basis for their theories. They are circumspect in conducting careful experiments and tabulating results with mathematical exactitude, determined to meet the requirements of a scientific age. Others, particularly in the field of education, indicate that they find the human element somewhat elusive in their laboratory and add to their interpretations consideration of social environment and personality factors.

Since people who promulgate theories have a noticeable tendency to gather evidence supporting their particular beliefs, there is a strong case made for nearly every school of thought. However, there is an undeniable degree of similarity among the varied points of view.

The basic fact they have in common is the simple truth that man does learn. He learns from the moment he is born. He learns through direct and indirect means, through formal and informal instruction. Sometimes he learns in spite of instruction. Sometimes he applies himself assiduously with discouraging results and other times he suddenly knows with little or no apparent effort. Sometimes he learns to be socially useful, sometimes he acquires skills which are adjudged harmful and negative. But he learns.

Non-human animals learn too, and rats and dogs have contributed greatly to the formation of theories of learning. Machines have been devised to take over many of our thinking processes but the business of learning goes on in one form or another, in the course of growing and participating in life.

But, how do we learn?

True to his principles, Socrates thought of learning and of knowledge as part of universal and eternal verities. For him, man was simply an example of the truth of eternal knowledge. But the mechanism behind man's personal awareness of this knowledge was something that Socrates did not attempt to explain.

For Plato the idea was supreme; only reason counted for anything. As for experience, it was merely a shadow of the idea of reality. Sensations and opinions, he held, are passing and unreliable. The immaterial essences- Forms or Ideas-were absolute for him, containing the only ultimate truth.

While the Greeks are philosophically stimulating, they fail to answer our question. However, we must consider the culture which produced such theories. Here was a society in which the individual counted for little, in which slaves were bought and sold, in which human life was cheaply held. As a result, a philosophy developed which expressed the need for security and permanence. Almost inevitably, on the basis of this explanation, abstract ideals of truth which exist above and beyond the individual were developed as absolutes.

Consider the mania for efficiency and speed in all areas of contemporary life. Is it surprising that the same influences are felt in the fields of learning and self-development? Consider the ever-increasing swarm of push-buttons which almost seem to run our lives. There are so many areas in which physical effort has been reduced to a minimum that perhaps we are ready to eliminate mental effort as well. The easy way is always the tempting way and, if the results are even better, why not take advantage of a time and labor-saving device?

In the area of psychotherapy we find there is a widespread need for professional help and, once again, we observe the temptation to do it the modern, easy way, to save time and money and effort. There is certainly a special appeal to those people who feel that they don't need extensive professional guidance, since they have only a few minor difficulties to work out. Whether or not this self-evaluation is correct, sleep-learning offers man an opportunity to take the easy way out.

Finally, in this age when education is nearly universal, the amassing of facts is considered an important achievement and, in the cases of the now-defunct quiz shows, a lucrative one. We are supposed to know something about everything-and there is so much to know. There just isn't enough time during waking hours. Often we are too tired to even care about improving ourselves.

Yes, sleep-learning has much modern appeal.

Still, only by knowing how we learn can we examine the effectiveness of sleep-learning. There is not, of course, complete agreement among authorities but if we can unearth points on which they do agree then we can evaluate sleep-learning against accepted theories.

Looking back a few centuries (1690), we find John Locke challenging the old doctrine that men come into the world with a set of ideas and a particular character stamped on their minds. He argued that knowledge was derived from experience, the result of ideas acquired through the five senses, and from inner experiences of the mind which operate in considering the ideas derived from sensations.

Only what can be perceived exists, according to George Berkeley (1710), and various combinations of perceptions come to signify objects or ideas. The perceiving is done by a distinct entity, the self, and nothing can exist except in the mind which perceives it. Berkeley asserted that all reality was mental and all nature a manifestation of God.

David Hume later (1748) affirmed that there was no knowledge beyond the evidence of the senses, that there was no such thing as cause and effect and that experience was primary in all

thinking. He divided the mind's perceptions into impressions (sensations, passions, emotions) and ideas by which he meant the faint images of impressions in thinking and reasoning.

A pioneer in psychological research, Johann Friedrich Herbart (1816) held that the mind is a blank on which experience writes, man learns by means of perception of the sense organs and by the process of association. Herbart attempted to explain psychic phenomena in terms of simple ideas and looked forward to a future system of psychodynamics determined by mathematical laws.

Wilhelm Wundt, who founded the first psychological laboratory (1879), denied rationalism. He devised experimental methods for measuring reactions to physical and physiological changes, effects and stimulations. But he did not consider the physiological aspect to be all of psychology. He was concerned with introspection, with analysis of "internal experience." He was convinced that the combination of the will, and emotional states closely connected with it, was more important than sensations and ideas in the explanation of psychological experience.

Another physiological-psychological approach was presented by Herbert Spencer (1855), who saw man as an organism adapting to its environment. He felt that sensations are man's natural guides and his most trustworthy ones-"when not rendered morbid by long-continued disobedience." This thought derived from his belief that man's senses were formed in accordance with the all-embracing law of evolution from a less perfect to a more perfect state.

William James knew both Spencer and Wundt, but rejected their principles (1890). He theorized that all learning begins in experience, that knowledge comes through an act of consciousness motivated by necessity.

Thinking, he said, is made up partly of perception and partly of idea formation. It is an intensely personal thing, highly influenced by emotion. It was James who first offered the 'stream of consciousness hypothesis.'

He said, "Objects once experienced together tend to become associated in the imagination, so that when one of them is thought of, the others are likely to be thought of also, in the same order or sequence as before. The laws of motor habit in the lower center of the nervous system are disputed by no one. A series of movements repeated in a certain order tend to unroll themselves with particular ease in that order for ever afterward. Number one awakens number two, which awakens number three, and so on, until the last is produced. A habit of this kind, once become inveterate, may go on automatically. And so it is with the objects with which our thinking is concerned."

Aristotle also described the nature of associative learning and explained the phenomenon of recall in terms of its laws. All psychologists since Aristotle have observed the rule of association by contiguity in time. Popular proverbs also bear out the observations: a burnt child dreads the fire; a person once bitten is twice shy; etc. Berkeley referred to "an habitual and customary connection" between ideas, one being the occasion for the next. Hume wrote of a "gentle force" by which one idea "naturally introduces another" if these ideas have previously occurred together.

James Mill (1829) concurs with these theories: "Our ideas spring up, or exist, in the order in which the sensations existed, of which they are copies. That is the general law of the 'association of ideas/ by which term nothing is here meant to be expressed but the order of occurrence." Mill felt the association of ideas could be either concurrent or successive, and that the association's strength was measurable in terms of its permanence, its certainty and its "facility." He further believed that frequency and vividness determined the strength of an association.

David Hartley (1849) stated that there was physical basis for association of ideas. This physical basis was in the brain, he contended, and the process of association was interlocked with bodily processes and not with ideas alone. He also believed that mental life was composed of sense impressions which left copies of themselves in the form of simple ideas or sensations, and, through association, these impressions gained the ability to call up other ideas.

Alexander Bain, an evolutionist and contemporary of William James, described (1855) behavior in terms of reflex and instinct. He noted that "Actions, Sensations and States of Feeling, occurring together or in close succession, tend to grow together, or cohere, in such a way that, when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea." Bain was interested in determining the conditions of learning. He would have liked to be able to explain retention as a neurological process rather than as a mental function.

A pioneer in objectivity, Edward L. Thorndike, the father of the theory of "connectionism" (1914), believed that simple association was not enough to insure future connection, but that a desirable effect was necessary to confirm it. His concept was that there must be contiguity, that if ideas act together they make up another intelligible association, and we then have a stimulus and response association. The hypothesis from which he started was that a neural bond was formed.

He conducted experiments to find out by what forces the learning process was conditioned when it was regarded as a connecting of bonds. Among his conclusions was the conviction that the learner's response to a given stimulus-other things being equal-depends upon the "strength of the connection" between them. Thus, the importance of 'stamping in' in learning.

Thorndike listed numerous laws to state his theory.

1. The Law of Effect states that, through use, the neural bonds are strengthened but that painful association decreases their strength.
2. The Law of Exercise states that a modifiable connection increases the strength, the lack of such connection will decrease strength.
3. The Law of Readiness deals with motivation and the explanation that it is satisfying to the subject to conduct when the conduction unit is ready.
4. The Law of Multiple Response describes trial and error learning.
5. The Law of Attitudes, Dispositions and 'Set*' claims that these conditions affect learning.
6. The Law of Partial Activity points out that there is a choice of elements that will lead to the aim.
7. The Law of Assimilation or Analogy states that the response is adapted from the experiences of the past.
8. The Law of Associative Shifting derives from study of the conditioned response.

Thorndike later offered an altered Law of Exercise which stated that mere repetition was not enough to insure learning, but that the degree of satisfaction involved must be given much importance. He also changed the Law of Effect to state that reward strengthens the connection, but punishment weakens it very little.

Further, as an argument against the Gestaltist, who declared that patterns are the basis of the learning process, Thorndike described the "spread or scatter" phenomenon. Each connection, he said, affects all the other connections, past or future, according to satisfaction. He based this explanation on biological foundations.

Another law had to do with Transfer of Learning and stated that a successful response could be gained to a new stimulus, if this new stimulus was similar to a past one. Since learning is transference, adjustments are possible and further learning can take place.

Recent research tends to discount Thorndike's theory of neural bonds, but much of what we accept today about learning still rests on his theoretical structures. There is little argument with his pronouncement that:

It is the first principle of education to utilize any individual's original nature as a means of changing him for the better. . . . All schemes of improving human life must take account of man's original nature, most of all when their aim is to reverse or counteract it.

An interesting postscript for our purpose is that Thorndike considered his laws of learning applicable to animals as well as humans. At least one sleep-learner felt the same way-the man who taught his parakeet its huge vocabulary.

Another school of thought about how we learn is that of conditioning. Its belief is that the nervous system is the basis of conditioning. This theory is a continuation of Ivan Pavlov's studies of the physiology of learning. Pavlov's experiments, with his celebrated dogs salivating at the sound of a bell, showed that conditioning can bring about reflexive responses to stimuli other than the originally effective ones. The conditioned reflex is explained as being the result of impulses traveling along the brain's neurons in chain fashion and creating a "reflex arc." John B. Watson espoused behaviorism (1925) and asserted that learning is a simple matter of stimulus and response. For example, fear is learned or unlearned. It is a simple matter of conditioning.

E. B. Guthrie (1952) developed Bain's idea of contiguity. He held that: "A combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement." For him, response is divided into movement (motor and glandular phenomena) and act (class of movements expressed through results). He sees learning as action as the result of repetition. He finds that a combination of movement helps to bring about the response, and Guthrie writes, "Effective practice is conducted in the general situation in which we desire the future performance to be given." Logically then, Guthrie would understand that sleep-learners would well be able to recall what they have learned while asleep.

Guthrie felt that forgetting is the inhibition of a response by a competing one, that habit-formation is linked to successful acts and that motivation affects the process since the last response modifies the situation and makes learning possible. This coincides with the rote-learning-plus-motivational approach of the sleep-study school.

Clark L. Hull (1943) formulated a system of behavior highlighted by the principles of habit-formation. He stated that the value of habits is dependent on their usefulness to the individual. In Hull's system, feeling and consciousness are not of great importance. He makes no distinction between emotional and other forms of behavior. In his careful mathematical description of human functioning, everything is behavior.

In his later work, Hull stated that "learning is a process by means of which the vertebrate individual survives in a world characterized by needs."

The keynote to his explanation of learning is reinforcement and his theory is founded on order and arrangement. Learning is the means by which the organism comes to perceive its world, through the stimuli to its neurological structure. Thus, in Hull's view of habit-formation, learning is conditioning-planning for proper responses, and need is the one for action. Drive gives direction to the response, satisfaction of need leads to reinforcement of stimulus-response connections.

Hull's students, Dollard and Miller, carrying on the idea that human behavior is learned, say that maladjustment is a manifestation of inadequate learning. For which we can no doubt substitute inadequate conditioning. In this connection, we are reminded again of Huxley's *Brave New World* and the responsibilities of the promoters of sleep-study and sleep therapy.

If the behaviorists are right, the speculation arises that perhaps all of humanity could be beautifully adjusted into an appalling uniformity.

Norbert Wiener, author of *Cybernetics*, attempts to relate human beings' learning mechanisms to the workings of electronic calculators, speaking of the feedback principle, which "means that behavior is scanned for its result, and, that the success or failure of this result modifies future behavior." This implies an integrating process measuring success and failure which will decide the response.

B. F. Skinner (1932) observed behavior and examined habit-building in order to find laws of behavior. The strength of the reflex was his basis of measurement. Although he did not use equations, he too devised numerous laws, including one measuring a threshold of stimulus intensity below which there is no response; one which indicates a latent period between stimulus and response varying with the intensity of the stimulus; one which describes responses persisting after the stimulus has ended, and one which states a similar effect when a stimulus is prolonged as when the intensity of the stimulus is increased. These are the static laws.

He also lists dynamic laws of reflex strength: the law of the refractory phrase, stating that the strength of the reflex is low or zero immediately after it has been evoked; the law of reflex fatigue, stating that the strength of the reflex diminishes during repeated elicitation, and returns

to its former strength during inactivity; the law of facilitation, which states that a second stimulus, not capable by itself of eliciting a response, may increase the strength of a reflex; and the law of inhibition, which is that a second stimulus which has no other relation to the effector involved may decrease the strength of the reflex.

Skinner too denies emotions and sees the laws of behavior as existing independently. Perception comes about through the reduction of drives. The effective stimuli lead to reinforcement of the desired response, and repetition or prolongation is all to the good.

The Gestalt explanation of learning stems from the premise that every phenomenon of nature is a whole, not merely a sum of its parts. This whole is the Gestalt. The whole is, in fact, greater than the sum of its parts. Everything is seen in relation to its background, as a figure within a framework, and it is the framework that gives meaning to the figure. We learn in patterns, not in separate parts. Each experience initiates a trace process, and in a different part of the brain there already exist traces which are the results of previous experience. These traces represent two different phases of learning. This system is held to obey the laws of organization. The interaction of traces results in an adjustment of forces, and the organization is continually changing to expand desirable Gestalts.

In time, the Gestaltists say, the compound trace organization transcends individual experiences and may influence their acceptability. Memory is a process by which the traces in the brain undergo certain changes. Rote-memorizing is a conditioned reflex technique, but understanding-apprehending relations, insight, etc.- makes recall more effective.

The Gestaltists say there is essential unity in perception, that "form" in experience is grounded in the physical world. Their claims are that intellectual processes operate as a whole in gaining insight into patterns -patterns which the Gestaltists assume exist in the universe; that the whole organism responds in a unified way from beginning to end in the learning process; that the organism reacts to total situations and proceeds from the whole to the part and from the general to the specific (the assumption again is that the whole is always greater than the sum of the parts); and that the learning process is one of reorganization-in other words, of forming proper Gestalts.

Motivation is considered important, along with the concept of the whole. This school of thought is a revolt against the stimulus-response interpretation of learning. They deny vehemently that reflexive action is the basis of learning, and find association too mechanistic. It is the quality of the experience, they claim, that makes the experience intelligible.

The process of learning, then, according to the Gestaltists, is one of perpetual patterning. Learning occurs when a stimulus pattern is perceived along with its significance for tension reduction. Forms of behavior which are consistent become part of habit responses. The major concern is with personality and integration.

One of the versions of the Gestalt school is Raymond H. Wheeler's "organismic" learning, which combines energy and subjective designations. Learning is measured in terms of reduction of tension and personality development, and improvement is "at the level at conscious behavior"; it

is not merely a result of conditioning, but a result of the relationship between the stimulus pattern and the learner's level of insight.

A theory of purposive learning is presented by Edward C. Tolman (1932). He too is preoccupied with behavior and the need for adaptation. His theory is based on association of stimulus situations with concepts, perceptions and expectancies. He is more concerned with achievement than with the means of achievement. He accepts the ideas that associations occur as a result of contiguity of stimulus pattern and perception or cognition, but he is most interested in the nature and complexity of the response.

He describes six kinds of learning: cathexes, "the acquisition of a connection between a basic drive like hunger and a specific type of goal object" like a particular food, or a negative drive like fright along with a specific object of fear, equivalence beliefs, "a connection between a positively cathected type of goal-and a sub-goal," or the equivalent negative, field expectancies, once called "sign-Gestalt expectation," the acquisition by the organism of "sets" or "field expectancies" on successive experiences in a particular environment which makes possible short cuts or roundabout routes, field cognition modes, meaning that field expectant is dependent not only upon memory but on perception and inference as well, drive discriminations, the ability to distinguish between different drives, motor patterns if learned (conditioned) when the patterns lead to the desired goals.

Tolman sees goals and configurations in a cause-and-effect sequence. The social environment is the stimulus, and rewards are of great importance. Practice leads to acquiring the "feel" of the situation.

Norman Maier (1931) offers a theory of frustration along with an explanation of learning. He found that frustration tended to freeze or fixate a response, even if punishment was the ultimate result of the response. He concluded that frustration is an aspect of behavior completely separate from learning. He divides learning into two categories, associative and selective, the first in terms of conditioning, the second in terms of the learning what happens in the course of solving a puzzle, where the outcome provides the direction of the learning. Behavior can be altered in four ways, he says: in the "extension of a response (conditioning) so that it will be expressed in a variety of situations," in changing the consequences of an action; in "a change of perception or stimulus interpretation"; and in "insightful problem solving" in which the goal influences the nature of the insight and resulting behavior; (this differs from trial-and-error learning in that insight rather than past experience directs the solving of the problem).

Maier describes behavior changes as: stimulus-response reactions "determined by neural connections only"; motivated behavior determined by the consequences of such behavior; and frustration, not guided by consequences but able to be changed by guidance, possibly because of associations acting through neural connections, and in this explanation the fixation response appears to be similar to association by contiguity.

A dynamic approach known as functionalism has been offered by F. S. Robinson. The factors which he considers important in learning are contiguity, assimilation (meaning that one activity prompts another), frequency and intensity. He too is concerned with adaptation, and his

interpretation of the mind is based on neural action. Man's intellect causes movements in the direction of adjustment, and environment is a major factor. Practice is extremely important, according to this theory, but operational personality factors are not considered.

Thorpe and Schmuller (1954) have attempted to draw from all of these theories a flexible, integrated understanding of the principle of learning. Searching for a definition, they find that, stated simply, learning is a form of behavior in the acquisition of facts, that it is a social and educational process involving both heredity and environment, and then they go on to suggest as an acceptable statement that "Learning ... [is] ... the total changes which occur in an individual as a result of his responses to representative stimuli, present or past.

This definition includes both the formal aspects of learning of one kind of another which takes place throughout the span of life." They believe that there is a relation between personality and the stimulus-response role of learning. Noting that all the theories of learning in acceptance today have grown out of scientific movement and have been experimentally verified, and noting also that individuals vary from the accepted norms, they suggest principles of learning drawn from all schools of thought. These include motivation, adjustment to the level of maturation, pattern learning (the importance of meaningful relationships), evaluation of progress, satisfactory personality adjustment, and social growth.

John Dewey saw learning as an experience, and was concerned with the integration and use of knowledge. His theory has been described as problem solving. Adding the social environment to the individual physical apparatus, as equally important to the process of learning, he looked forward to a time when this process would be one in which the functions of the human organism are used in such a way as to make learning socially effective.

It can now be demonstrated that the theory and practice of sleep-learning basically coincide with the accepted theories of the psychologists of learning. In both theories, major stress is given to the primary needs in learning of repetition, reward, motivation and association. Indeed, the direct approach of sleep-learning utilizes these basic concepts to a much more valuable degree than heretofore possible in the science of learning.

CHAPTER V

VALIDATION

Perhaps one way of testing the validity of sleep-learning claims is to compare their consistency with the results of the careful experimentation conducted by the leading psychologists of learning. If they coincide, we can assume there is, at the very least, considerable validity in the sleep-study technique.

What would the ancient Greeks have said? Socrates might have doubted that awareness of universal truth could become a meaningful part of man by virtue of his hearing the refrain repeated during his sleep. Plato might have had similar doubts although both would probably have embraced the opportunity to increase their knowledge.

Aristotle noted the frequent recollection of what is frequently thought about, apparently setting the pace for the stress on repetition. He said, "it is a fact that there are some movements, by a single experience of which, persons take the impress of custom more deeply than they do by experiencing others many times; hence upon seeing some things but once, we remember them better than others which we may have seen frequently."

And what do the sleep-learning people claim? They find that, once the barriers are overcome, it takes but a few short hours to memorize a play, a whole book of notes or a foreign language.

They also find that repetition is useful. So learning in one's sleep carries with it the same contradictory qualities as conscious learning. Some things require frequent repetition and some are remembered almost immediately. Fewer repetitions are necessary during the Transitional Sleep Period than during the Reverie Period. Sleep-learners can no more explain these phenomena than could psychologists since the days of Aristotle. They can only verify the findings.

Thus we find consistency-even if it is in contradiction.

The early thinkers who stressed the importance of perception through the senses were undoubtedly speaking of perception during waking hours. Here, too, sleep-learning has a common point since it is through the sense of hearing that the subject learns during sleep.

The physiological methods and careful measurement of results, can be considered one of the forerunners of sleep-teachers. While the final answer has not been found, and the successful results can be explained only partly by science, it must be acknowledged that the sleep-learning investigators are attempting to interpret and apply the evidence they have gathered in the light of present scientific knowledge and discoveries.

The theories of association-learning do not appear to be applicable to sleep-learning. The advantage of understanding the material and thinking about it intelligently during waking hours is stressed, but no importance is given to the connections between ideas and facts.

On the other hand, the ideas of reflex and succession, of "stamping in," of the importance of motivation, of the conditioned response, of the positive effects of reward (real and anticipatory) and of recognition of individual differences all crop up in sleep-learning literature.

Trial-and-error learning seems to have no place in what we learn and absorb while asleep. Nor is there any concern with the theory that transference of successful responses makes further learning possible, except that once the barrier is broken, the capacity to sleep-learn expands. From the reports of how sleep-learning is used in Russia, there can be no doubt that it owes much to discoveries of the conditioning school of adherents as an explanation of how we learn. Once again there is agreement with those who find that motivation and success affect the learning process and that reward strengthens it. There is also agreement that forgetting is inhibition of the response (or learning) by a competing response (or information).

The sleep-therapy approach appears consistent with the behaviorists in that both seem to feel that reinforcement of stimulus-response habits, if they are useful, will make for a happy adaptation to environment; and neither seems to require special consideration of feelings, emotion or consciousness except in terms of behavior.

It must be noted that responsible sleep-learning advocates recognize that problems exist where sleep-therapy alone is inadequate.

What sleep-learning appears to have in common with purposive learning is the importance of achievement and rewards.

From the layman's point of view, there is a good deal of hair-splitting from one school of learning to another. We find highly technical terms, obscure language of specialists and convincing arguments behind every theory. Thorpe and Schmuller's attempt to state principles of learning which are flexible and drawn from all schools of thought appears to be the best solution, the one most likely to consider all proven factors and to result in a balanced, unbiased view. They include motivation as an important factor. This is stressed in sleep-learning. They are concerned with mature adjustment. So is sleep-learning. They consider pattern-learning and meaningful relationships as basic. This, too, coincides with the advice of sleep-learners. Evaluation of progress is deemed important. This is a major aspect of the appeal of sleep-learning. Satisfactory personality development and social growth are dual goals in traditional learning and sleep-learning.

It is unlikely that Dewey, who was concerned with learning as experience and with the importance of the social environment, would have been enthusiastic about sleep-learning. He was less interested in the acquisition of facts than in the integration and use of the knowledge acquired. Perhaps the ultimate answer is a careful combination of the advantages of sleep-learning and the conscious use of understanding-which, in fact, is strongly advocated in the printed instructions of sleep-learning.

On the whole, there appears to be considerable evidence that the methods of sleep-learning are to a great degree in accord with the views of the psychologists of learning.

CHAPTER VI

THE MIND AT WORK

It may be possible, when more is known about the tape recorders in our brains, that we will be able to evaluate the theory which finds a parallel between the human learning process and the activity of the "thinking machines."

We could point out that sleep-learning information is fed to the human mind by machine in a reversal of the familiar feeding of data into a machine by a human. In the first instance, the human can select the information to be given. In the latter, the machine dips into its memory bank to furnish information.

The importance of repetition in sleep-study is easily evidenced by the repeated message recordings at present available to the sleep-learner. These high-impact repeating tape cartridges are pre-recorded and can be used for many varied purposes, among them:

Rapid language learning: increased vocabulary, comprehension, absorb proper intonation, pronunciation ... by repeated impact.

To improve speech: hear yourself as others hear you, record your voice, note errors, record models you wish to imitate, absorb the instructor's speech pattern ... by repeated impact.

In most instances, the cartridge is available to the student with an induction pre-recorded on the tape. The sleep-learner can then record his message on the blank unrecorded section of the tape. By leaving the induction on the tape, the sleep-learner can change his recorded message as he desires.

Positive suggestions are predominant on sleep-tapes:

- Correct weight is a matter of good health. You will develop an instinct to select and eat the foods which will be conducive to good health and correct weight. . . .
- You will succeed. You will overcome this problem. . . .
- You will remember the information recorded on this tape. You want to remember each word, its pronunciation, its meaning. . . .
- You want to develop your vocabulary because you know that it will be of great use to you in business and social contacts. . . .

Statements are constantly affirmative and delivered in a calm, strong, reassuring voice. With the reinforcement, there is the promise of reward.

It should be understood that the subject really believes the message. This positive conditioning is particularly effective in view of the fact that there is so much negative thinking in the constant "no, no" and "don't" that each child hears in the course of growing up. The impression that everything desirable is forbidden is a common heritage, indeed. And so, the basic idea behind development tapes is the psychology of reward coupled with positive affirmations.

How the affirmations should be stated is a matter which the individual can decide. One school of thought says the subconscious should be directed to take immediate action. Another recommends a gradual, step-by-step approach. Examples of each follow, the first demanding immediate action, the second action by degrees:

1. From this moment forth, I shall have an intense dislike for alcohol. The slightest taste of alcohol in any form will make me violently sick. I shall become sick from even the smell of alcohol. Because of this, I shall never taste alcohol again. Before very long, the desire and need for alcohol will disappear completely. I know that I have the power to withstand the temptation to drink . . . AND I WILL NEVER DRINK ALCOHOL AGAIN!

2. I am, by degrees, acquiring an extreme dislike for alcohol. Slowly, but very surely, the taste or even the smell of any form of alcohol will nauseate me. Before very long, I will become violently sick at the taste of alcohol and I will lose all desire to ever drink again. By degrees I will accomplish this and . . . I WILL NEVER TAKE ANOTHER DRINK AS LONG AS I LIVE!

The "by degrees" advocates claim that nothing ever occurs instantaneously and that direct approach might possibly create a subconscious conflict. However, the method of command would differ individually as in conscious acceptance of orders.

The subject-matter of sleep tapes is as varied as are the problems that beset human beings. A few examples of the messages which have been used to break bad habits through frequent repetition follow: ("I" may be substituted for "you" but the latter is considered more commanding.)
BREAKING THE SMOKING HABIT

You are slowly, bit by bit, acquiring an intense dislike for smoking. Little by little, the taste of tobacco is getting more disgusting to you. Before long, you will be caused to become violently sick to your stomach upon puffing a cigarette, or indulging in any form of tobacco. By degrees, you will break yourself of the tobacco habit . . . and will never touch another cigarette!
OVERCOMING INSOMNIA

You are, slowly but surely, sleeping better each night. Each night as you lie down in bed, you will think of deep, restful sleep. You will not awaken until (specify desired awakening time) in the morning. By degrees, you will overcome your sleeplessness and will never be touched with insomnia again. Your entire body will feel alive and refreshed when you awaken, because you have spent the night sleeping peacefully, deep in gentle and relaxing sleep.

NAIL BITING

You are, by degrees, slowly beginning to stop biting your fingernails. You are slowly overcoming your nervousness and inner tension . . . you realize that you have been biting your nails because of nervousness and inner tension. By degrees, you are becoming more and more content to stop this vile habit. You have pretty (handsome) hands and you do not want to spoil them by biting your nails. Little by little, you are becoming able to resist the temptation to bite your fingernails . . . and before very long, you will never bite your nails again.

OVERCOMING STUTTERING

You are, by degrees, slowly overcoming the cause of your stuttering. Little by little, you are talking more normally . . . with less breaks and pauses in your words, each day your confidence grows stronger. Each day your stuttering grows less. By degrees, day by day, slowly but surely your stuttering is disappearing. Very soon now, you will be able to talk perfectly . . . slowly . . . distinctly . . . without stammering . . . and you will never stutter again.

(It should be noted here, that one authority on speech disorders stated that sleep-messages are effective in abolishing stuttering only as part of a planned therapeutic program, under the guidance of a therapist, for a specific purpose in the course of the therapy.)

NARCOTICS

You are, by degrees, acquiring an intense dislike for (name of narcotic: heroin, opium, etc.). Slowly but surely you are losing all desires and need for narcotics. You are, by degrees, without conscious effort or pain, overcoming your craving for (name). Before long, you will no longer desire or need narcotics in any form. They will be repulsive to you. The very thought of (name) will make you physically ill, and you will cause yourself to vomit if you even think about (name). Your body is getting well and your organs are getting used to the gradual withdrawal of (name). By degrees, you are pushing this great destroyer of your life, out of your mind . . . out of your body. You are gaining again the love and respect of your family and friends. Very shortly now, all desires, all cravings for (name) will be gone forever and you will be free and very healthy physically and mentally, full of the joy of living . . . and filled with desire to love and live again.

BED WETTING

You are starting to get sleepy, Jimmy. (Use name, repeat 10 times) More and more sleepy (repeat 10 times) . . . your eyes feel so ... so ... heavy . . . you are getting so ... so ... so sleepy (repeat 5 times). Jimmy, you are going to stop wetting your bed and make mommy and daddy love you better than ever. While you are in bed you can't let out a single drop of (use exact word that the child uses. Repeat 10 times). Mommy and daddy are so very proud of their big boy for not wetting the bed. We both love you so much. Good night and happy dreams.

Discussing the permanence of results, the sleep-therapy advocates say it depends on the individual's degree of suggestibility and desire to overcome the habit or problem. Once broken, the habit should not return, but in the case of a strong compulsion, the message should be replayed for several nights.

The physiological explanation for the effects of repetition in sleep-therapy which is offered is that: any persistently duplicated or long sustained repeats of some specific mental picture will eventually bring about vast electronic or sub-molecular shifts within the body and usually eliminate the roots of the disturbance. As to the suggestibility of the individual, everyone is suggestible to some degree, and by conscientious practice should be able to develop that suggestibility to a degree. Schrenk-Netzing placed the number of persons susceptible to direct

hypnosis at 90%, so the incidence of those susceptible to indirect suggestion should run substantially higher, probably 99%.

Repetition is also used to induce relaxation and receptivity to the material to be learned. The most accepted method is the use of word pictures to suggest a gradual descent into the lower realms of consciousness. Word pictures vary, but they must always offer a peaceful, gradual descent: using an escalator . . . descending deeper . . . dee . . . per . . . deeper . . . into pleasant sleep and relaxation. Repetition of the words "deep" and "relax" is constant. A progression of movement is used, always going DOWN . . . ree . . . laxed . . . dee . . . per . . . dee . . . per. The vivid impression necessary in the induction can be the word picture of descending a staircase, step by step; relaxing on a couch or bed as it slowly descends into the realm of sleep and subconscious receptivity.

It is apparent that the sleep-learning approach is, in many ways, consistent with the principles of hypnosis. Stress is laid on the importance of relaxation, on creating a favorable emotional attitude, on the power of suggestion and in the use of monotonous inflections to bring on drowsiness.

We can now investigate sleep-learning in the light of present knowledge and theories about memory.

CHAPTER VII

MEMORY

What makes us remember? Why do some people have good memories and others poor? Why do we remember some things with ease and find it almost impossible to retain others? Is there a technique of remembering, a trick of association, a gimmick of arrangement? Or is it as simple a matter as remembering what we want to remember, and forgetting what we don't want to remember?

In defining memory, James D. Weinland writes that there is no sharp dividing line between learning and memory, since all learning is based on memory. He makes time the one distinction, in that memory is learning that persists. A memory so ingrained that it requires no effort at all is a habit. Memory is a function of the mind, and greater intelligence and better memory usually occur together.

Memorizing, according to Knight Dunlap, has to do with thinking about as well as of the item. It also has to do with desire to learn, and with persistence. He recommends avoiding constant evaluation of progress; progress should be checked, but infrequently. Full attention should be paid to the subject, and, added to that, he suggests negative practice—the effort to forget. The reason for negative practice is the theory that effort is detrimental to achievement. So often we are not able to remember something no matter how hard we try, then when we stop trying we suddenly find ourselves remembering. So Dunlap turns it around and says to try to forget, and this effort will get in the way of forgetting.

In the remembering of details, Dunlap says, the purposes behind the remembering must be considered. Is the subject memorizing in order to use the details thus acquired or for the sake of a stunt? Dunlap is weighing values as well as means in this discussion. He also mentions the importance of personal and social adjustment.

The over-all theory behind Dunlap's discussion is that the way of learning lies in the formation of habits. Here we see a similarity to the conditioning theory. But in Dunlap's approach other factors are stressed as equally important. In order to break habits, for instance, it is necessary to understand the situation, to accept the proper ideals, to have a genuine desire to realize these ideals, and to persist in practice aimed at accomplishing the end in view. There are habits of thought and habits of emotional response. Learning ability, which he calls intelligence, varies, with home influence, social training, basic learning ability and incentive.

Ian M. L. Hunter, in discussing memory, tells us it is easier to recognize than to recall. Among the considerations in determining how quickly we can memorize are meaningfulness, which helps, and the amount of material to be memorized, for as the material increases, the length of time necessary for learning increases disproportionately.

The characteristics of the learner must be considered as well—his emotional state, the deterrent effects of illness, fatigue, drugs, or excitement. It is theorized that age affects learning capacities as well. It is claimed that there is a progressively diminishing increase in memory span with the

increase of age. Intelligence brings with it high learning efficiency. And speed has values apart from the time-saving aspects: it has been found that a fast learner learns better.

Hunter reports that reading plus recitation results in better learning and remembering than reading alone. The explanation is that the combination of the two involves active participation, provides knowledge of results and increases motivation, and constitutes direct preparation for later recalling. He finds pros and cons in the argument about whole versus part learning. Both, he concludes, have their uses. Whole learning is good for short pieces, but a combination would be necessary for longer and more difficult material.

Short learning sessions are advised.

The best results are achieved when they are spaced.

Accurate first impressions are extremely important.

Rhythm in the material is important.

Overlearning (review) is recommended, as well as integrating the material.

There is no one cause of forgetting, Hunter states. The reason could be physiological-for instance, a deterioration of the trace, that is, of the organic changes produced by learning; or an actual injury or disease of the brain. Another cause could lie in behavioral processes, which include retroactive interference, altered conditions during remembering, and repression.

It is pointed out that interpretation can affect or distort memory. This accounts for inaccurate witnessing, where the facts reported are the results of observation plus interpretation. This includes on-the-spot interpretation, which happens almost without the observer's awareness, and the subtle changes that occur in the course of thinking about the event later. The memory becomes clouded and colored by myriad influences.

Hunter says the hypnagogic state (Reverie Period) just between waking and sleeping, is the time the subject is particularly rich in imagery, which is frequent and vivid.

An interesting point is made about the difference between memory and the use of knowledge. It has been noted that along with the development of skill in abstract thinking there is a decrease in imaging ability. If there is a correlation between imaging ability, as there appears to be, and receptivity in general, are we then, to assume that analytical thinking tends to inhibit the capacity for quick rote memorizing?

This leads on to the phenomenon known as photographic memory. Hunter tells us it is an incorrect term, that this kind of memory isn't really photographic. It is actually a form of visual imaging, very strong in children, but rare among adults. This capacity is known among the researchers as eidetic memory-a high degree of visual imaging, but not totally photographic in that everything that is seen is registered, no matter how irrelevant to the material. Selectivity is involved-something unknown to the camera lens.

Hunter draws a fine line between learning and memory. Little or nothing is known of the physiological process. He lists as efficient techniques of study: selective observing or perceiving, organizing of the material and distributing the effort involved in study, and he rates organizing and finding the underlying principle most effective. Efficient learning, he says, is deliberate and fully conscious-not drill.

The neat little packages of advice offered by memory specialists are the conclusions drawn from the numerous investigations made in the field. Careful experiments have been conducted and the results tabulated and correlated, and from these results certain behavior is concluded to be representative of the process. Since the tests usually involve only a sample group, they cannot be considered absolute proof, but they do indicate a tendency, at the very least. Here is a brief review of some of these investigations.

One of the earliest memory experiments was conducted by Hermann Ebbinghaus at Harvard during 1892-93. He came to the conclusion that things heard and seen spontaneously were remembered best. Subsequent experiments did not always bear this out. In some instances variations were found among age groups. Some found hearing more effective, some sight. In 1912 Henmon noted that most individuals are of the mixed imagery type. But again in subsequent experiments different results were obtained. Wewick tested seventy college subjects in 1932, and found that the auditory mode of learning was superior for them, both for immediate recall and for recall after a delay of from five days to five months.

In 1934 Stanton's experiments bore out this finding, but not with statistical significance in all cases. In the area of suggestibility, or influencing, Wilke found the audiovisual combination more effective, and since his subjects did not know they were being tested this experiment was more like an actual life situation.

Frank R. Elliot notes that prior to 1932 simple or nonsense materials were used, and in these experiments the results favored the visual over the auditory mode of learning. But since 1932, when larger numbers have been tested, using connected, sense materials, auditory was favored over visual learning. Elliot conducted tests for recall and recognition, using fictitious advertisements. His results showed the highest scores in a combined visual-auditory approach, the next highest for auditory methods, and the third for visual.

In discussing why the best results were obtained when audio and visual stimuli were combined, Elliot states that tests have shown that a summation of stimuli, facilitation, and heightening effects are characteristic of the simultaneous stimulation of two receptor systems. He notes that we hear better when we see as well, and that we see better with a combination of other sense stimuli-auditory, olfactory, and cutaneous. This phenomenon is accounted for by the spread of energy in the cerebrum, flowing in two-or perhaps all-directions. It was found that under combined audio-visual stimuli accuracy improved as well. The visual-auditory approach seems, Elliot finds, to reduce distractions, improve attentions, remove uncertainty, enhance accuracy, and reinforce memory impression.

In its own area, the sound of the human voice has been shown to be of great value. There is social satisfaction involved. Cantrill and Airport found that people prefer, two to one, to hear

news on the radio rather than to read it in a paper and nine-to-one to hear a speech rather than read it. Elliot notes, however, that the role of habit must be considered in this argument of audio vs. visual, for people adapt to shifts.

Elliot found that memory was better after broken or serial presentation. The advantage, he concluded, seems to lie in the distribution of learning and in repetition. Another of his conclusions is that education shows in the difference in memory. College groups usually remember more than non-college groups. The explanation offered is that they see more relations and their associational capacities are stronger. Tests to determine the differences in memory capacities between the sexes were inconclusive. In some areas men were shown to remember more than women, but the combined visual-auditory advantage was not so significant for men. The possibilities that women listened to the radio more, or were less well educated, were offered as explanations. The impact of television since these tests were conducted may reveal different results.

Elliot suggests that perhaps the reason for the advantage of audio over visual stimuli lies in the fact that during audio experiences no time is spent examining.

The stimulus is received as presented, so there is a more equal distribution of attention. Early in the century a study of auditory memory consciousness was made by F. Kuhlmann. He used phonograph records to investigate recall of auditory material. As he saw it there were three modes of recall: auditory imagery of the words appeared at once without any process preceding it as an aid to recall; concrete visual imagery of the persons and things referred to appeared first as a means of recalling the words; or words were inferred from the contents as already recalled. Kuhlmann found that the character of auditory imagery varied with reference to the completeness with which the sentence was recalled directly (in auditory terms material is remembered not in sentences but in fragments); that it varied with reference to the degree in which the words were imaged in the quality of the individual voice; that the imagery of the voice in its true character sometimes appeared without the recall of any words.

Kuhlmann also found changes in recall according to the lapse of time between hearing the material and testing for recall, which he did after one, three and six weeks. The greatest changes occurred between the immediate and the second recall. There was a striking transformation from the immediate to the last recall, in both the manner of recall and the final result, in the auditory imagery of the words. Visual imagery was not constant in immediate recall; it preceded the auditory in most cases in the last recall, and increased in amount, so that the visual imagery alone presented the whole scene and event. The general clearness and vivacity of the visual imagery remained about constant throughout the several recalls.

The total amount recalled in auditory terms decreased markedly, sometimes leaving only a sentence or two that could be recalled after six weeks' interval. The fragmentary character of the recall, however, did not increase much.

There were progressive stages in the quality of auditory imagery: first, the voice was imaged in its individual quality; next it was imaged merely as a bass or tenor; after that it appeared in a

somewhat characterless fashion; and finally there was no definite or complete auditory imagery at all before the words were formulated and stated in the recall.

The processes involved in memorizing also changed. At first, attention was divided between actual sounds and visual imagery. The first repetition or two brought with them the process of naming sounds and imitating them. During further repetitions visual imagery and naming quickly disappeared, and motor processes of imitation increased for a while, but tended, finally, to drop out.

Kuhlmann had his subjects recall sounds in a semi-passive way, without making any effort in the direction of detail or vividness. In 53% visual imagery appeared first, in 15% naming the subject of recall came first, and in 8% motor processes came first. Visual imagery preceded auditory imagery in 55%, the name preceded the auditory image in 24% and motor processes preceded auditory imagery in 13%.

Visual imagery was described as consisting of the things that produced the sounds (although attention to visual imagery for purposes of recalling details proved detrimental to recall); of the things going through the motions they would make in producing the sounds; or of visual sound analogues, consisting of arbitrary forms, sometimes including colors, whose characteristics were patterned after the characteristics of the sounds.

The motor processes which were used in imitating the sounds were inseparably connected with the effort to recall the sound vividly and minutely.

The auditory imagery was very fragmentary, and could not usually be directly controlled voluntarily, but only through motor processes, or, in some instances, through visual imagery. Sleep-learning observers have pointed out that some time periods are more favorable to learning and some less. Edward Van Ormer conducted an investigation to determine the best time for study in terms of how well we remember later what we have learned. He examined retention after intervals of sleep and waking and found that on the whole recall was most efficient after sleep.

Other investigators he reported on came to the same general conclusion; Jenkins and Dallenback said that "forgetting is not so much a matter of the decay of old impressions and associations as it is a matter of interference, inhibition, or obliteration of the old by the new." Heine said improved memory resulting from "sleeping on" the learned material was due to the elimination of the retroactive inhibition produced by the day activities which normally follow learning.

Van Ormer goes along with this. He explains that sleeping after studying gives best results because of the absence of the inhibition or obliteration of the learned material by the waking activity. He theorizes that another factor enters into it, that it is possible that the waking activity not only inhibits and obliterates what has been learned, but that it also prevents or holds in check a preservation or consolidation process which continues for a while in the nervous system after the impression of the learned material. This preservation or consolidation process may often be at its highest point for the first part of the hour following learning. He suggests that it is also

possible that the process of waking and the activity that takes place before there is any relearning is inhibitory as well. Still, he points out, results show there is a preservative process.

Van Ormer offers the explanation that perhaps recall is benefited by the refreshing effect of sleep on the organism, but notes that the same results were achieved whether the subject slept one hour or eight hours. Moreover, the results were the same one hour after the study period regardless of whether the hour was spent sleeping or waking.

The results suggested, on the whole, that a primary factor in forgetting is the action of the interpolated activity, because it inhibits a consolidation or preservation process and produces inhibition and obliteration of learned material. Retention was, for the most part, better after four or eight hours of sleep than after the same time interval of waking.

Little is forgotten during sleep. This appears to be an argument in favor of late night study, and perhaps also in favor of "cramming" before examinations.

A. E. Wagner conducted one of the early experiments "to determine the number of repetitions necessary to memorize and retain with maximum certainty a miscellaneous collection of facts." He noted the effectiveness of Jesuit methods of thorough and repeated drill and was thus inspired to study the value of frequent repetition. He concluded that it was best to employ a relatively small number of repetitions with a constantly increasing interval of time between the repetitions, continuing over a rather long time period. His results showed that high school students, on the average, needed six repetitions (of his selected miscellaneous facts), and grade school students averaged about seven repetitions.

The physiological explanation of memory generally accepted today is that everything we experience or learn produces some physical change in the brain, leaves some kind of a trace, sometimes called an engram.* Weinland suggests that the memory trace may be a lowering of the resistance to passage of the nervous impulse from one cell to another, so that the next impulse passes across more easily.

We have already discussed Thorndike's laws of learning, which state the importance of motivation, repetition, reward and meaningfulness; and the Gestalt emphasis on the whole, the meaningful configuration (Weinland* The communication system between the cells of the nervous system is the physical basis of the association of ideas in the brain. Brain injury, lobotomy, or disease of the brain have been shown to affect certain areas of the brain, but not all. points out a danger of inaccuracy with regard to detail in the Gestalt principle).

Weinland does not agree with the memory improvement authorities that anyone can be trained to have a good memory. Improvement is certainly possible, but the one invariable is the person's potential. This cannot be increased. He tells us that psychologists agree with William James that retentiveness, that is, capacity for remembering, cannot be improved by effort or training, because it is dependent on the brain structure. Within the limits of the potential, however, memory can be improved like any other skill.

Among the common and useful memory devices that many people employ without outside instruction are numbering, classifying, and visualizing. Those who have not learned to use these devices by themselves can gain in efficiency by applying themselves in this way. Motivation is important too-not just in the sense of wanting to improve one's memory-but in the more particular sense of wanting to learn specific things for specific purposes.

The more driving the need or desire, the more effective will be the memory.

Interest is important, and explains the fact that memories, even remarkable memories-are usually especially good in only one area. People with amazing memories for things in general are probably interested in everything. Weinland concludes that a person's memory can be called poor only if he forgets many things that deeply interest him after making an effort to remember them. Sometimes forgetting is simply a matter of incomplete learning due to lack of attention or interest. An impression has never really been made on the mind. Weinland and others think there may be evidence that nothing experienced is ever completely forgotten, unless there is a brain injury or atrophy. The explanation that forgetting is the result of fading of the trace is contradicted by the recovery of many forgotten memories in the course of psychotherapy, by association, and also in hypnotherapy, where patients have been 'regressed' and, under hypnosis, even speak and write like a child of the age desired, with emotions and experiences to match, unchanged by what happened later in the subject's life.

It has also been found that recall of meaningful materials is as much as 50% better under hypnosis. Recall is also better in other states characterized by relaxation -abstraction, free association, "twilight sleep," and simple relaxation.

Brain injuries sometimes result in loss of memory, but not always. Often there is no noticeable amnesia, or it is temporary. The location in the brain of the injury (or of surgery) makes a difference in the effect on memory. Certain diseases may result in amnesia, for instance, syphilis, epilepsy and Korsakoff's disease (a result of alcoholism). Serious lack of oxygen or blockage of blood circulation through the brain can have permanent destructive effects on the brain and therefore on aspects of memory.

Deterioration of memory with the years may be part physiological, and part psychological, Weinland says. It is physiological when an old person forgets things he wants to remember, but it is psychological when he forgets things which have become unimportant to him. Both factors contribute to the apparent fine memory for events of childhood and youth and poor memory for recent events.

Weinland tells us that, according to the evidence, brain damage is greater in its effect on memory of recent events, and in addition the present and future are frequently of less importance to old people who may find more satisfaction in remembering earlier happiness. Loss of interest in life makes them dismiss memories of no importance, and then the ever present tendency to forget what we don't care about remembering takes over. But generalizations cannot be made; some old people remain mentally alert and suffer no serious memory loss, and they make up for such as there is by experience, accumulation of knowledge, ability to organize, and increased capacity to comprehend.

Weinland goes on to state that some forgetting is active, or defensive-selective, in order to clear the mind of material irrelevant to the immediate purpose. He reminds us that Pavlov found that associations can be unlearned.

Freud said we bar unpleasant things from consciousness, and sometimes complicate the forgetting-and betray ourselves-with what are known now as Freudian slips. He found that childhood experiences which had lasting and damaging effects but were apparently forgotten, had merely been repressed because they were too disturbing to be admitted, and that these incidents could be recalled with sufficient effort and encouragement.

Weinland reports that the theory that we forget unpleasant things has been tested, and that the findings indicate that usually pleasant things are remembered better than unpleasant things, but there is no great difference quantitatively. Further, both pleasant and unpleasant things are remembered better than indifferent things, and pessimists tend to remember unpleasant things and forget pleasant ones. Repression, then, exists in one way or another. Amnesia is a complete escape through repression; this frequently proves to be disturbing and thus a motivation is created for recovery. Small-scale amnesia, or "blacking out," is often protective. Repression can also operate for reasons of pride, to avoid anxiety, and to make past memories more acceptable by alteration of the facts.

Memories fade more rapidly when they are not in use, or reviewed. (Here Weinland makes a distinction between recall and recognition; the former is lost much more quickly than the latter.) But the material learned is not altogether lost, for it can be relearned in less time than was necessary when the material was completely new.

In the course of his experimentation, Ebbinghaus found that forgetting begins rapidly and then slows down. Davis and Moore tested retention and found that material meaningful to the learner was remembered better. Nadorah Smith reported that with material retained for a long time the forgetting process is slowed down considerably. E. J. Smith found retention high in motor acts; he explained this as due to the fact that greater organization is required for this sort of learning, and Weinland adds that since motor learning is often overlearning, retention is further aided.

The interference of emotional factors (e.g., love, fear, anger, insecurity) can cause forgetting, as can another manifestation of complete concentration-absent-mindedness.

Forgetting can sometimes be attributed to blocking of the item for which recall is desired. And finally, when a task is completed, it is frequently forgotten because the mind has decided there is no further need to remember anything about it.

Proceeding from investigation of the nature of remembering and forgetting, various authorities have attempted to devise principles, rules, and systems to aid in improvement of memory.

Somewhere around 500 B.C. Simonides worked out a system of assigning things to be remembered, a position in space; a method also employed by Quintilian and Cicero. In the seventeenth century Henry Hudson applied a similar system involving association by visual symbol. A complicated digit-letter system was used as far back as the fifteenth century, appeared

in Germany in the seventeenth century, and in England in the nineteenth century; this approach involves considerable practice and is applicable only to rote learning. It is also useful for theatrical type stunts. Successive-comparism systems-broad associations in a kind of chain systems-have been invented; these often require remembering as much inventive associational material as can be found in the already logically associated material of a well planned text.

Another system was based on paired associates, like pen and ink, and combined number associations with visual imagery of absurd combinations which were presumed to make the combination, and thus the key word, memorable. Known as the Roth Memory Course, its major value is in the field of entertainment and for particular occasions, not for lengthy retention. Weinland's principles behind memory improvement stress the importance of interest, of selection, of complete attention, of accuracy in the first learning against speed, of proper instruction if necessary, of understanding (meaningful learning), of background associations to reinforce the meaning and discrimination to discern relatedness, of the "mental set" or intention to remember -effective even for a specific length of time, of confidence that we can remember, of a reasonable degree of ego involvement, of specific meaningful associations or connections, of a background of knowledge, of good organization and classification of the material ("A good memory is like a well organized and well maintained filing system/" he writes), of combining whole and part learning, of dividing material to be learned into separate groups in order to simplify the task, and of reinforcing the memory by repetition and use.

Weinland rephrases the above principles for remembering a particular fact:

1. Try to see its significance, try to be interested in it, or at least in the value of remembering it.
2. Give it your attention, be sure you have it right.
3. Be sure you fully understand it.
4. Intend to remember it.
5. Be confident you can remember it.
6. Involve the ego if possible.
7. Associate it with other related facts.
8. File it in its proper place in your memory system.
9. See it as a part of a larger whole.
10. If there is a basis for doing so, learn it as part of a small group of related facts.

In discussing study methods, Weinland emphasizes the importance of an environment conducive to study. He too points out the value of using all the senses to reinforce memory, and reminds us that verbalization can be an aid to motor learning. In discussing the auditory and visual aspects, he refers to an investigation by F. C. Bartlett, who found that visual memorizers tend to be quick and confident in their learning and in reproducing the subject matter-quite directly, with less dependency on grouping, comparisms and secondary associations than auditory memorizers, who in addition reached for signs and cues and descriptions, and who are less confident in recalling subject matter.

On the other hand, visual memorizers were more likely to change the material in recall, or to change the order or add material not originally included. A combination of the two is, of course,

preferable to either one method alone. Visual aids are always useful in fixing a memory, as are efficient reading habits. Marking up a book or taking notes in a lecture also help, by further affixing attention in the course of learning and for future reference when review is necessary, as does recitation for the purpose of self-testing. Review soon after learning, because of the quick early forgetting tendency, is useful, and spaced practice is important. Weinland tells us that sometimes the review is more meaningful if there are slight changes in method or point of view; this is of interest in our study because the sleep-learning investigations report better results when the material is not changed.

The recommendations to study before going to sleep are modified by Weinland, "unless physically or mentally overtired." He also recommends, on the basis of several studies, learning the material in the evening before going to bed, and reviewing it the next morning. He too values overlearning, but feels it should be used with discretion. And he notes that miscellaneous items can best be remembered by finding a pattern or principle for it: a pattern in the spelling or in the arrangement of numbers, in features and appearance and behavior of people, in the rhythm and melody of music, in the customs of a group, and in suffixes in language; a principle of spelling or grammar rules, a principle behind group customs which presents them in a unified way- and so forth.

Rhyme, numbering, alphabetical order, abbreviation, a kind of acrostic system of making words out of first letters of a series of facts, pigeonholing (Simonides Spatial Arrangement), translation of numbers and letters already referred to, paired associates and chain associations (also referred to above) are all mentioned by Weinland as memory devices that have some value but also limitations. Numbering ceases to be useful when large numbers of items are to be considered; alphabetical order may result in blocking; abbreviation can be confusing, or even come before remembering the whole fact for which the abbreviation stands; acrostics are artificial and may discourage attempts to understand the material; pigeonholing is not a good substitute for arrangement by logic and organization; number letter translation is a complication requiring special learning and practice and appears to be useful for little more than tricks; paired associates and chain association have been discussed elsewhere and are not recommended for wide use. But all of these devices can be useful and helpful in particular circumstances.

Since reports on sleep-study point to so much success in learning foreign languages it will be interesting to consider what wide-awake learners have to say on the subject. Weinland considers interest and enthusiasm of primary importance, interest not only in the language, but in the country where it is spoken. Conversing with a person for whom this is the native tongue, and reading newspapers and magazines in the language serve both to heighten interest and practice. Pictures and advertisements help the beginner to understand the captions in foreign literature. Knowledge of current events through reading papers in English (or the student's own language) makes it easier to understand articles on the subject in a foreign paper. Subscribing to periodicals also offers good spaced practice, which is found useful in remembering.

The card system, with the foreign word on one side and the English word on the other, is recommended, with frequent practice in self-testing. Attention and accurate first learnings, with awareness of both the similarity to and the difference from the English equivalent, are stressed. A combination of the visual and auditory aspects of both the word and the thing it represents is

necessary to make the subject think in a new language. Finding the relatedness among various foreign words is valuable, and idioms too, must be tied together. Reciting and self-testing in writing is essential, especially for the grammar.

Surveying the recommendations of the memory experts, what conditions and methods do we find conducive to recall? And how far does sleep-learning coincide with these findings?

We find consistency in many areas. There is agreement that certain time periods are better than others, that study just before sleep helps avoid retroactive inhibition of memory, also that motivation, knowledge of achievement, reinforcement by review, thinking about the material, learning during spaced intervals, understanding and repeating are vital. Reciting and writing out the material, relaxation, interest, confidence, health and freedom from drugs, over-learning, reinforcement of motor learning with verbalization, the proper environment, and general conditioning or habit formation are also important and helpful elements of memory.

The effort to forget does not seem to be important in sleep-learning, since this form of memory stems directly from subconscious activity. If that constant evaluation of progress indicates worry, anxiety, and possible barriers in the early stages, it is implicitly considered undesirable in sleep-learning as in conscious memorizing. Meaningful material is easier to learn both awake and asleep, according to the authorities of both schools. Association and coexistence are not stressed, except as a general free-association activity in connection with repetition, in the literature of sleep-research, nor is there too much discussion of whole and part learning, broken and serial presentation, or grouping of material.

Sleep-study advocates report no age limitations in learning capacity in older people, and seem to disagree that there are individual limits to learning potential. But they all agree that incentive is important, and the entire system of sleep-learning precludes the possibility of wandering or divided attention. They recognize the interference of emotional problems and recommend sleep-therapy as a means of overcoming these. They seem not to be directly concerned with home influence and social training, although these are probably recognized as part of the emotional attitude. Distortion of interpretation is hardly likely during the first learning, since the subject is asleep, and the possibility of distortion occurring is subsequently not mentioned. Accuracy of first learning seems to be assured, if the tape has been prepared correctly and accurately.

The question of whether the material is pleasant or unpleasant or indifferent and the effect on memory is not dealt with. Reports indicate that rote-learning of just about anything is possible, but incentive and motivation and interest are recommended, so this can conceivably be related to the pleasure-displeasure theories.

Efficient techniques, selectivity and organization of material, finding underlying principles or patterns-all these are recommended by sleep-learning advocates as part of the learning process. Consistent with psychologists' findings is that auditory learning which is the basis for sleep-learning, has been found to be more effective than visual learning.

Among the conscious aids to memory which are helpful to a degree, few appear to be important in sleep-study. Numbering, classifying, visualizing, spatial arrangement, digit number systems,

paired or chain associations, abbreviations-these are not mentioned at all. Rhyme is referred to as the easiest material to learn during sleep, and is thus recommended to begin with. Ego involvement is certainly apparent in the sleep-therapy recordings, as well as in the relaxing and preludes to sleep-learning tapes.

It would be interesting if the sleep-learners were able to conduct tests to discover whether or not memory acquired during sleep suffers in recall from proactive inhibition (previously learned material) or from blocking, and what degree of cue dependency is involved in this method. According to testimonials, students who learned foreign languages during sleep achieved amazing results in a short time. When we compare these claims with the busy schedule recommended by authorities OH conscious learning of a language, we can only gasp at the time and effort saved. Again tests would be interesting to discover how well the student acquires the living feel of the language, understanding and accuracy in the use of grammar, and whether or not he thinks in the new language.

On the whole, there appears to be enough consistency in the theories of conscious memory and sleep-memory to indicate considerable validity in the latter approach.

Certain conscious effort must still be made, if the knowledge thus acquired is to be used intelligently. But the degree to which drilling and rote learning, which are required in many areas of study, can be cut down will obviously stimulate interest and incentive to experiment with the possibility of sleep-study methods being of great use to us all.

CHAPTER VIII

HYPNOSIS AND SLEEP-LEARNING

Theodore X. Barber of the Department of Psychology of American University conducted tests in 1956 comparing suggestibility during light sleep and hypnosis, and found his subjects as suggestible in one state as in another. Since many hypnotists and hypno-therapists endorse sleep-learning and sleep-therapy, the results of the experiment bear out even further the claims and theories upon which sleep-education is based. And if there is that much similarity in the two states, it follows that much or all of what can be accomplished by hypnosis can also be accomplished by Sleep-learning or Sleep-therapy.

A New York hypnotherapist reports that the dual application of Sleep-learning or Sleep-therapy and direct hypnosis has provided her with the most nearly perfect tools of therapeutic treatment. Her controlled tests over the years have been so uniformly successful that she has recorded her curative technique for common emotional disorders, thus making professional self-development available to the public at a fraction of the cost of therapeutic consultations. All reports indicate a high degree of success.

In 1957, Pope Pius XII sanctioned the use of hypnosis as an anaesthetic.

A recent article on hypnosis in Life magazine, while noting that hypnosis is not, most certainly, a cure-all, and will not bring recovery from illness except when used along with other medical treatment, describes its potential value in treatment of a physical illness where there is a definite emotional element involved. Among the problems mentioned as responsive to help by hypnotherapy are asthma, anxieties, compulsions, phobias, and harmful habits such as excessive smoking, drug affliction and alcoholism. Hypnotism may also help strengthen a desire to live, or bring peace of mind, according to this report. It can, by suggestion, set off conditioned reflexes and even affect physiological processes.

Apparently hypnotherapy will not work on everybody. Perhaps 15% of the population is resistant to it, for reasons of extreme youth (children under four) or senility; feeble mindedness; and various emotional or mental health conditions. Of the rest, it is calculated that 85% can achieve a light trance, 60% can achieve the second stage, and about 40% the deep stage. Only about 20% can be somnambules. But since the trance depth can be increased by practice, perhaps those experts who say every normal person is a potential somnambule are right. No matter, since the very deep trances are not required for effective hypnosis. The benefits of hypnosis can be had while in the lightest stages, upon total acceptance of the suggestions offered.

Life reports that the most important aspect of hypnosis lies in its capacity to relieve stress and anxiety.

There has been considerable success in the treatment of peptic ulcers, and also in treatment of dyspepsia, chronic gastritis, colitis, high blood pressure, rapid pulse, heart palpitations, impotence and frigidity, poor bladder control, menstrual difficulties, and skin disorders such as eczema and hives. Babies have been delivered under hypnosis, and bad habits like bed-wetting

and blushing have been eliminated. Motivation is stressed as important, of course, and along with this hypnosis has been employed to break the smoking habit, to overcome insomnia, and to help people reduce and gain weight.

Weight reduction experiments reported by Dr. Lawrence B. Winklestein in the New York State Journal of Medicine were extremely successful. On the other end of the scale loss of appetite has been overcome.

A series of articles in the New York Post, May 1959, describes the successful personal hypnotic reducing experience of a female reporter of that paper.

Life reiterates the warning found in all responsible literature on the subject-that symptom removal must be used with caution; the cause of the disturbance should be treated lest another and worse symptom replace the one being eliminated. Many hypnotists disagree, claiming that bad effects of symptom removal, where it was indicated, were at a minimum. One, in particular, claims that in hypnotherapy the symptom substitution she has used with great effect, is the substitution of accomplishing the elimination of a harmful symptom. In other words, she had found that the ideal symptom substitution is the elimination of the detrimental symptom, and the resultant pride of accomplishment.

In many instances, as reported by Life, hypnosis has been used along with deep therapy with success, sometimes to remove resistances and leave the patient accessible to psychotherapeutic help.

In the June, 1960 article in Pageant magazine by Gerald Walker, it is stated that hypnosis has become a powerful medical tool. Dr. Milton V. Kline, Research Project Director for Hypnosis at Long Island University, states that the usefulness and value of hypnosis "are as infinite as the capacities of the human mind, of which it is a function." The Pageant article goes on to state that the cautious American Medical Association officially pronounced hypnosis "a useful technique in the treatment of certain illnesses." The AMA held a symposium on the use of hypnosis in major surgery and more research and better instruction in all its therapeutic uses.

The Pageant article also mentioned that an estimated 5000 U. S. physicians use hypnosis. Dentists, psychiatrists, psychoanalysts and clinical psychologists are taking advantage of the benefits of using hypnosis in treatment.

In 1958 the AMA Mental Health Council's report on hypnosis urged that the science of suggestion should be taught in medical schools.

In England hypnosis has been utilized as a medical and therapeutic aid since its enthusiastic endorsement by the British Medical Association in 1955.

There are sometimes short-lived uncomfortable post-hypnotic symptoms, but hypnosis in itself is harmless, according to Life. It is agreed that subjects will do nothing during hypnosis that is in contradiction to their own values or that threatens their self-preservation. On the other hand, strong criminal tendencies, otherwise latent, may be released. Because we are all a mixture of

social and anti-social impulses, it is stressed again that in hypnosis the integrity and competence of the practitioner are of the utmost importance.

Dr. Frank A. Pattie of the University of Kentucky helped a few people to wear contact lenses through hypnosis. It is believed that, if applied to education, hypnosis may be able to increase comprehension, retention, speed of learning and general efficiency, and also supply motivation to learn and pleasure in performance. A violinist improved her technical performance without playing or looking at the music, simply hallucinating a practice session in a trance in distorted time. (Hypnosis has been able to create the illusion of time flying or standing still.) Warts have been made to disappear by hypnotic suggestion, and a hallucinated match can blister the skin. At this time, sleep-learning can achieve results to rival those of hypnosis, and, since the technique does not require an experienced practitioner, it benefits directly the persons involved. The mechanical and electronic tools of sleep-learning are easily used by the learner, and since he himself is in the position to determine the suggestions placed during sleep-study, greater control is evident.

Sleep-learning techniques have improved memory, trained children, speeded up learning, taught languages with correct pronunciation, raised school marks, increased music appreciation, eliminated blocks, rendered a minimum of sleep sufficient, upped salespeoples' capacities, eliminated nightmares and insomnia, and aided people to become relaxed and positive.

In 1947 a record called "Time to Sleep," made by Ralph Slater, became the subject of a court case. The record claimed to cure insomnia, but the government doubted this and eventually seized the records under provisions of the Federal Food and Drug and Cosmetic Act, saying the discs were misbranded. Slater brought suit. In court in 1950, witnesses, including psychiatrists and neurologists, testified that tests they had made using the record yielded negative results. Sixty-eight people in the courtroom heard the record played and did not fall asleep. Some claimed to have been irritated and excited.

Backing up Slaters claims, a psychiatrist informed the court that the text was similar to that used by psychiatrists in treating patients, and that, under the proper conditions, it could induce sleep, although not in every instance. Another witness said there was no change in his patients' sleeping habits as a result of the record.

A witness for the defense stated that on four different occasions the record had helped him get much needed sleep. And, the director of the Sleep Shop at Lewis and Conger, the New York department store, said that his department had sold a substantial quantity of the record in the preceding three years, and less than four percent were returned by the purchasers. Slater spoke in his own defense and asked that the case be dismissed as not coming under the Act, since it was not a food, drug or cosmetic.

Subsequently two neuro-psychiatrists said that it could induce sleep if the subject were receptive to suggestion.

As a result, Judge Leo Rayfield ordered the records returned to Slater. But his judgment was later reversed by the Court of Appeals, which decided that the records and labeling were misleading and false because the discs proved wholly ineffectual in some tests.

Apparently this was a single record-an extremely unsophisticated version of the much more efficient sleep-learning and sleep-therapy equipment available today, with its automatic repeating tapes, electric timers, pillow speakers, and careful reduction of mechanical noise. It is most essential that we recognize hypnotism stripped of the false raiment in which it has been clothed by history. The hypnotist is not a super-endowed being; with applied study and training, we are all hypnotists.

Since the door to the subconscious is best opened by suggestion, there is an evident relationship between hypnosis and the science of sleep-learning.

CHAPTER IX

MODERN SLEEP-LEARNING

There have been many scientific advances since the days of the ancients. We do not forsake our homes and sleep in temples where priests whisper the right thoughts into our ears. Today, through the use of highly developed audio equipment, pre-recorded tapes and recordings and automatic repeating devices, we ourselves can record the message we require.

In 1929 Max Sherover, one of the pioneers in sleep-learning, wrote a science-fiction story called "Cerebro-phone, Inc." Here was an apparently fanciful excursion into the realm of sleep-education. Later, Sherover and a San Francisco engineer, Elmer Brown, produced the first sleep learning device, using a combination of record player, electric clock, and under-the-pillow-speaker. They foresaw use of their invention in the fields of language teaching, treatment of emotional upsets, overcoming of speech defects, and (shades of Aldous Huxley) principle indoctrination.

In the early 1940's, L. Leshan reported in the *Journal of Abnormal Psychology* that he found in his tests with this method that 40% of a group of fingernail biters became convinced by the message in the night that their fingernails tasted bitter, and gave up the habit, after being exposed to the message six times a night for fifty-four nights. In the same experiment a control group kept right on biting.

In the original testing of Sherover's machine, Charles R. Elliot of the University of North Carolina used fifteen unrelated three letter words on his sleeping subjects: boy, egg, say, art, run, not, sir, leg, bag, row, ice, out, age, box and eat. He verified that his subjects were asleep by an electroencephalograph, which records brain waves. (Brain waves are different during sleep and wakefulness.) The next day, this group, and a control group who had not heard the words in their sleep were asked to memorize the list of words. The first group learned the list 83% faster than the group which had not been exposed to the words in their sleep. Elliot said he thought sleep-teaching was similar to reteaching something the person has temporarily forgotten. Sherover reported that his students were learning languages 25% to 30% faster than students normally learn while awake.

In 1948 Sherover prophesied that the device could be used to teach such necessary information as multiplication tables, chemical formulae, the Morse Code, logarithms, speeches, vocabularies and languages. He was indeed conservative in his forecasts.

It was in 1949 that Ramon Vinay's feat in sleep-learning a complete opera in accentless Italian became celebrated in musical circles.

A 1952 newspaper report (*New York Times*, July 6th) informs us that the Morse Code was taught to sleeping cadets.

In 1952 the *Journal of Experimental Psychology* reported tests which had been conducted at George Washington University. Students were taught Chinese during sleep, between two-thirty

and three A.M. The students were divided into three groups: the first group heard the Chinese words, but with mismatched English words; the second group heard the Chinese words and their English equivalents; the third group heard Strauss waltzes. The first group required 11.1 repetitions; the second group mastered them in only 5.6 repetitions, and the third group needed 17.7 repetitions (so far as we know this group was not tested on their knowledge of Strauss waltzes).

An interesting side effect was the report of a girl who dreamed she was on a street in China; this was assumed to be the influence of the Chinese words she heard in her sleep. Naturally, this cannot be proved; the dream could have been caused by other associations. But it does invite speculations as to the degree of unconscious visual reinforcement present in sleep-learning. Bruno Furst, the memory expert, stated that good memory is based on concentration and association, grouping of similar facts together, and then linking them by easy to remember mental pictures.

The last point-easy to remember mental pictures -raises the question: could dreams be supplying this aspect of remembering for the material heard during sleep? Sleep-learning advocates explain that sleep-tapes achieve involuntary duplication or repetition of a desired specific mental picture, with cumulative and powerful effects.

Devices employ two techniques: one utilizes a tape machine; the other employs a record player or phonograph. In the case of the latter, the record player should have all four speeds, 78, 45, 33/2 and 16 RPM-because the available records come in these different speeds. The record player must also be able to repeat the records over and over automatically; if it is the type record changer that automatically shuts itself off, the shut off lever must be taped down.

Tape machines are preferred to record players. The magnetic tape equipment of today allows the student to record and play back his study material immediately on the same instrument. Tape allows the absolute minimum of undesirable noise. Whereas a record can become worn and scratchy, the tape has an unlimited noise-free life. Anything available on records is easily transferred to tape, and, since tape operates on a principle of organization and reorganization of magnetic particles on the tape ribbon, when there is no further need for the study material presently recorded, tape can be easily erased by recording over the original material.

An endless tape cartridge of varying time lengths, depending on the study time of the material to be learned, allows continuous repetition of the material. These nocturnal messages are heard through a "pillow speaker" which rests under the pillow and, by controlling the volume, will repeat the message for your ears only. For those who toss in bed, or who are slightly hard of hearing, a speaker of the bone conduction type is also available, which operates as an under the pillow speaker, but sets up audible vibrations that will be carried to your ears at any reasonable distance from the speaker.

Any model of tape recorder may be used. However, an organization of sleep-learning researchers is preparing equipment which has been designed specifically the recording is not as it should be, simply record over the unwanted portion, for sleep-learning.

The automatic electric timer is essential to sleep-learning, for it sets the tape machine to switch on and off automatically while the learner sleeps. Without it, modern sleep-learning would be impossible, for the student would be required to be awake to switch the mechanism on and off. The timers simply plug into a wall outlet, and the recorder is plugged into the timer.

Beginners are reminded to hold the microphone about ten inches from the mouth and to speak in a normal, assured, positive voice when recording. It is advised that the recording level be monitored or checked immediately to determine the clarity. One distinct advantage of tape is the lack of added expense for errors.

The advertising industry must be thanked for the development of the endless tape cartridge. These were originally devised to repeat sales messages over and over. Cartridges offering a mobius loop are coated on both sides and offer twice the recording and playback time. For sleep-learning it has been found that the speed of 17/8 IPS (inches per second) is the most practical. This speed allows more than adequate fidelity for voice, and its slowness enables a great deal more study material to be placed on the tape.

When determining the correct pillow or bone conduction speaker to use with the available recorder, two things must be emphasized: the insertion of the speaker plug must shut off the recorder's speaker, otherwise both speakers will play, and the resultant effect will negate the required effect; and, of equal importance-the components used with the recorder must be carefully matched. A mismatching of pillow speaker and recorder will cause distortion, and distortion has been found to be a disturbance which might create a barrier against sleep learning.

The sleep-learning tape machine can be equipped with additional speakers, simply by installing a "Y" jack into the tape output. These are available in most local radio service stores. Relaxation affirmations can either be recorded on a separate tape, or on the same tape as the study material. After some practice in sleep-study, when the student is aware of his psychological acceptance of the recorded messages, it will not be necessary to use the relaxation affirmations; the information itself will beat a direct path to the subconscious.

Many companies offer both phonograph and tape equipment with all necessary accessories for the sleep-learner. They also have available numerous pre-recorded tapes and records of educational and therapeutic material.

Three steps are advised in some record courses. The material designed for the conscious mind is on one side of the record, and the material for the subconscious is on the other side. First the visual approach is employed when the subject reads the text. Next the audio approach while conscious (awake). The material on the conscious side is much like the text on the conscious side of the recording. The third step is the subconscious approach- side two of the recording, prepared with emotional appeal to the subconscious. The subject matter is similar to that on side one, but different words and symbols, timing, expressions and reasoning are used, aimed not at the intellect, but at the emotions.

The particular course described above has ten lessons, designed for deep relaxation; for physical well being-aimed at psychosomatic illnesses; for memory power in the sense of training the mind

to retain and recall information automatically; for will power and ultimately leadership and success; and on through magnetic personality, self-confidence, physical vitality, sleep therapy (in the sense of overcoming insomnia and the need for drugs and pills), financial success (give the inner mind proven formulas for success, wealth and power), and finally, self-mastery, in which the inner mind is trained to overcome destructive thoughts, forces and habits.

Among other recordings are those designed to overcome unsatisfactory marital relationships, to develop power (over oneself and others), weight reduction through training the listener to desire thinning foods, and music therapy to release hypertension.

Children's courses-the home approach to child psychology-are offered in the form of a children's story aimed at overcoming undesirable habits and traits. The text on these recordings is read by the parents, and the recordings for the children are played both awake and asleep. It has been found that children do not require conditioning; they have not yet been subjected to the great quantity of negative thought we constantly receive throughout our lives. Nevertheless, the child should become used to the records before they are used at night.

The sleep learner can make his own therapy tapes. If he does, he is advised to keep his sentences short and to the point, positive and optimistic; to use strong action verbs, avoiding too many adjectives and terminology that would be difficult to understand, or medical or scientific jargon. He must believe in himself and his message, must accept the idea and transform the idea into reality, both of which effects are achieved by the subconscious. A strong, commanding voice, calm and unhesitant, a voice that does not falter but reflects "dynamic certainty" is best. He should be sure of proper microphone level and use an automatic continuous tape repeating mechanism.

Among pre-recorded tapes which are offered is one called "Hypnotic Rain Tape." This is a sound effect recording containing the actual sound of falling rain (laboratory controlled) which is designed to aid in relaxation induction, hypnotic trance induction and self-hypnosis. It is recommended for use by itself or as a background for sleep-learning or sleep-therapy material, as well as to overcome insomnia and the barrier to sleep learning.

There are miscellaneous offerings with the stated end result being: a brighter philosophy; a conviction that you can sing-or sell-or speak-the first of which implies that sight reading and voice training can be taught by audio-visual affirmations; creative inspiration and peace of mind through affirmations that will induce positive thinking, friendship, hope, forgiveness, peace, poise and will power. You can sharpen your bridge game, increase shorthand speed, improve your English and gain poise and self-confidence at the same time, simplify the learning of typing, and acquire a knowledge of any foreign language with the correct pronunciation. You can dip into the secrets of meditation and relaxation according to yoga, and increase your creative facilities through an understanding of the power of the universe, the Infinite Intelligence, and the power of thought.

Your child can be saved the trouble of doing these things in the future, for the courses are available (reportedly proven in field tests for three or four years) for producing self-confidence, magnetic personality, memory power, as well as instilling such good habits as an interest in

learning, obedience to elders, sharing and unselfishness, cleanliness, neatness and good manners, along with eliminating such bad habits as bed wetting, nail biting, poor eating, stealing, cheating and lying. Fears and bad dreams can be overcome . . . and all while the child is asleep. Of course, the accomplishment of all these things by the children could easily eliminate the need of parents using their own records for inducing relaxation, bright philosophies, physical vitality, and a positive outlook on life.

From the listing of literature available on recorded material, it is now possible to go to sleep and catch up on your reading at the same time. It is not indicated that these "talking books" be used in sleep learning (unless, of course, the student so desires), and certainly the repeating mechanism would not be a desirable adjunct to reading a novel. But perhaps, somewhere, sometime, there will be a sleep-student who must memorize a novel. After all, who would have thought of sleep-teaching a parakeet?

CHAPTER X

THE ULTIMATE AID TO LEARNING

Some of the literature referred to in our study of sleep-learning suggests that there is very little that cannot be learned, accomplished, or cured by this method. The independent thinker may well raise a skeptical eyebrow.

On the other hand, careful study of the evidence of responsible observers indicates that there is great validity in the claims about sleep-learning. It can and has been a valuable aid to, but not a substitute for, learning with the conscious mind.

Responsible advocates stress the importance of conscious understanding of the material, of intelligent organization and analysis, of review during waking hours, of motivation and of interest in the material.

Where it is necessary to learn lists or material not in itself meaningful, literally by rote, sleep-learning sounds like an absolute blessing. Most of our basic learning is rote material, absolutely necessary before we can go on to analytical thinking. If children can learn multiplication tables and the alphabet much more quickly and easily with this method, there seems to be little reason to quarrel with the idea, on the basis of knowledge available to us today. And if adults stock up on facts necessary in their fields painlessly, it is all to the good. It is to be hoped that mere accumulation of facts is not going to be substituted for understanding, evaluation, interpretation or analysis of material. There is a general tendency in our time to value information per se more highly than the capacity to think.

Sleep-learning can aid greatly in time-saving, in increased efficiency, and in improving general knowledge. It will be up to the individual practitioners to use it wisely.

Warnings that sleep-therapy should not be employed as a substitute for medical or psychotherapeutic treatment are included in most of the literature. Again it is up to the individual to follow these instructions for his own protection. But it is also a responsibility of the manufacturers of recorded material aimed as psychological self-help to keep them within the limits approved by specialists in the field of psychotherapy. Just as hypnosis, in the hands of a careless or irresponsible practitioner who does not combine it with intelligent application of psychotherapeutic methods where necessary, can be a dangerous technique, so sleep-therapy misapplied, can do a disservice to people seeking help.

Sleep-learning's potential is staggering.

Increasing sales of sleep-learning equipment indicate that interest in the technique is growing constantly. The beneficial uses of sleep-study have barely begun. It is to be hoped that so important a scientific achievement will be given its rightful place among educational and learning techniques.

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AUTHOR'S NOTE

Since the field of Sleep-Learning is a constantly changing one, I feel the reader should benefit from my continued research. Upon your sincere interest, I shall be pleased to answer your questions about Sleep-Learning, and advise you of any new developments in the field. Enclose a stamped, self-addressed envelope in your letter to me, care of Libra Publishers, 445 West 23rd Street, New York 11, New York, and I shall reply as soon as is possible. -- D.C.