

MILTON KRAMER

The Dream
Experience

A Systematic
Exploration

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*The crown of the aged are the children's children
and the glory of children are their parents*

Proverbs 17:6

Contents

Preface		ix
Acknowledgments		xiii
Chapter 1	Introduction	1
Chapter 2	Do Dreams Exist?	17
Chapter 3	The Recall and Collection of Dreams	33
Chapter 4	The Measurement of Dreams	51
Chapter 5	Dreams and Psychological Differences	63
Chapter 6	Normative Dreams, Typical Dreams, and Repetitive Dreams	75
Chapter 7	Psychopathologic Dreams (Nightmares) and Dreams in Psychopathologic States	91
Chapter 8	The Reactive Nature of Dreaming	107
Chapter 9	Dreams and Waking Thought	117
Chapter 10	Dream Meaning	129
Chapter 11	The Functions of Dreams	161
Chapter 12	The Biology of Dream Formation	189

viii • Contents

Chapter 13	Journey's End? No, a Time for Assessment	205
	Bibliography	211
	Index	231

Preface

The “Dream Experience” is intended to provide for the mental health professional a systematic scientific basis for understanding the dream as a psychological event. It will in addition describe a method for examining the dream text to extract a figurative meaning for the reported dream. This understanding of the dream will provide support for utilizing the dream report to confirm and expand the therapist’s view of the *weltanschauung* of the dreamer and facilitate his utilization of the dream in therapy. The research program that I pursued for over four decades provides the basis for my observations and conclusions about dreams and dreaming.

The experience of dreaming has been described in our most ancient texts, e.g., the Beatty Papyrus from Egypt and in the Gilgamesh myth from Mesopotamia. Dreaming is the peculiar accompaniment of sleep during which events occur in which we may participate, simply observe, or just have a feeling they happened that has forever intrigued people. How are we to account for an event that engages us without our being awake and conscious? What can the meaning be of such an unusual event? The earliest explanations were that the dream episode was caused by supernatural forces either benevolent or malevolent. And that the meaning of the dream was to be sought either in dream books in which dream events have fixed interpretations or in more sophisticated texts which take into account the life circumstance and experiences of the dreamer such as that attributed to Artemidorus of Daldis. Professional dream interpreters could be visited in the temples of Aesklepius in Greece or in the streets of Jerusalem. By the 18th century, the supernatural basis for dreaming was replaced by a

natural explanation, namely some alteration in the biological functioning of the body, particularly of the brain. W. Robert, a 19th century dream theorist, suggested that dreaming was the brain disposing of mental waste much as Crick of DNA fame was later to claim as well. The interpretation of dreams remained an exercise of matching the dream events to a fixed meaning in a dream dictionary or linking the dream imagery to some universal symbol.

Dreaming in the modern era has been refocused by two events; one was the psychological description by Freud in 1900 of how the mind creates the dream experience through the dream work mechanisms. The second was the discovery by Aserinsky and Kleitman in 1952 of Rapid Eye Movement (REM) sleep, the biological substrate of much of dreaming. Freud's studies of dreaming provided (1) a theory of the function of the mind; (2) a method, free association, to establish the meaning of dreams; and (3) a treatment technique, psychoanalysis, which captured American psychiatry of the first half of the 20th century and supported a continuing professional interest in dreaming. The discovery of REM sleep, the biological substrate of much of dreaming, attracted the interest of psychiatrists because the promise of such intellectual giants as Freud, Jung, and Hughlings Jackson was that if we understood dreaming, the sane man's psychosis, we would begin to understand psychosis, a major public health problem in the mid-20th century. The ability to collect a number of dream reports from a single night made possible the experimental study of dreaming. Reliable systems to quantify dream content had already been developed and the systematic study of the content of the dream experience from its modest beginning in the last decade of the 19th century was vigorously expanded. New approaches to establish the possible meanings for dreams were undertaken. The series of studies undertaken and discussed in this work explores the proposition that dreams are a legitimate object of scientific study.

This systematic scientific exploration of the dream experience illustrates that the dream report can be legitimately studied scientifically. The dream is an experience extended in time and not the product of the awakening process. There is reason to accept that the dream report is a veridical reflection of the dream experience and not a secondary confabulatory response to being asked: What were you dreaming? It is abundantly clear that dream reports can be recovered from awakenings in the sleep laboratory or spontaneously reported and recorded by subjects in their dream diaries. There are reliable and validated dream content scales that permit the quantification of various aspects of the dream report such as the number of characters in the dream, whether the interaction among the characters was friendly, aggressive, or sexual, where the dream took place

and whether there were scene changes in the dream narrative, and what emotions, if any, were expressed in the dream.

The “Dream Experience” will be presented in 13 chapters. Chapter 1 is an introduction that addresses the historical reasons people were interested in dreaming, modern reasons for studying the dream, and the problems in studying subjective processes like dreaming. In chapter 2, the question of whether the dream actually exists or is a product of the awakening experience is addressed. Chapter 3 focuses on whether dreams can be adequately collected in sufficient numbers at particular points in time to permit quantitative study, and in chapter 4, if they can be collected, are there reliable and valid measurement devices that will permit the quantification of variables of interest or will the essence of the dream experience elude our measurement efforts or be destroyed by them.

With the questions that have been raised about the variability of dreaming is there reason to believe that dreaming is an organized enough experience to be the object of scientific study? In chapter 5, I will review the evidence that dream content is signal not noise, that it is regular and not disorganized. Where there are psychological differences at the group level, there are systematic differences in dream content. At the level of the individual, dreams of individuals are different from each other and the dreams of an individual are different night to night.

In a book about dreaming, certain aspects of dreaming need to be addressed: (1) what do most people dream about during so-called normative dreaming? (2) types of dreams that occur frequently and apparently in all cultures, typical dreams; and (3) dreams that reoccur to a dreamer across time, the repetitive dream. Chapter 6 will encompass these special types of dream experiences: normative dreaming, typical dreams, and repetitive dreams.

Chapter 7 will review work on psychopathologic dreams, nightmares, and on dreams in psychopathologic states such as schizophrenia and depression. Nightmares reflect integrative disturbances that may be short-lived or chronic while the dreams of the mentally ill reflect their cognitively and emotionally altered mental condition.

Circumstances and events that have been shown to influence dream content are discussed in chapter 8. Dream content is responsive to the emotional experiences of the previous day, to new and continuing novel situations, to interpersonal situations, and to hearing familiar names during sleep. Chapter 9 describes the relationship between waking and dreaming thought from a state and trait point of view and shows that waking emotion and dream content are related. Dreams appear to be more reactive to prior wakefulness than proactive to subsequent wakefulness while emotions in dreams are more proactive than reactive. Dreams have

the necessary orderliness to support the possibility they are meaningful, and in [chapter 10](#), a methodology, dream translation, is described and examples of its application to dream samples are provided to assist the reader in applying the method.

A frequently asked question is: Does the dream serve any adaptive purpose? [Chapter 11](#) reviews theories of dream function pointing out that function may relate to how the dream is constructed or to what dreaming does. Freud has offered the view that dreaming serves a sleep protective function. Solms has confirmed this in showing that brain-injured subjects who report the loss of dreaming also report more interrupted sleep. I have concluded from the research I have done that dreaming is a selective affective regulator, sort of an emotional thermostat that changes affect across the night. The significance of changing affect across the night is that how you feel on arising in the morning is a major determinant of your psychomotor functioning.

Selected theories that describe a biological substrate for dreaming are reviewed in [chapter 12](#) and critiques are provided related to biological theories of dreaming in general and each of the theories in particular. [Chapter 13](#) is a summary and concluding chapter addressing the regularity of dreaming, the basis that provides for the possibility that dreams are meaningful, the approach to extracting meaning that suggests that dreaming reflects the dreamers affectively determined worldview, and the recognition that biological approaches do not adequately address the syntactic, semantic, or pragmatic aspects of dreaming. An analogy of dreaming to delirium was questionable in the 19th century and remains so today.

Acknowledgments

I look back with pleasure and sadness as I remember the wonderful people who were so crucial to my 46 years of productive work in the field of dream research and sleep disorders medicine. My thoughts traverse a “Sentimental Journey” filled with the generosity of so many people who provided the environment, opportunity, and support for my endeavors. Life and careers are with people and it is to a group of teachers that I want to begin to express my gratitude. The intellectual environment and experiences at the College of Medicine of the University of Illinois in Chicago laid the foundation for my interest in research. I worked in the kidney pharmacology laboratory of the late Ted Sherrod, M.D., who made the observation that if you don’t publish within five years of graduation you’re unlikely to ever publish. The late Douglas Goldman, M.D., who was medical director of what was then Longview State Hospital in Cincinnati facilitated my first project that resulted in a publication in 1958, only four years after graduation. Yes Ted, I was counting.

I trained in psychiatry in a remarkable department with a remarkable chairman, Maurice Levine, M.D., who provided an intellectual atmosphere of unusual depth and breath. It was to Cincinnati that I returned after two years in the military with wife and three children to begin working at the VA hospital under Hal Hiatt, M.D., who was encouraging, supportive, and a dear friend who remains in my heart and mind. Roy Whitman, M.D., who had one of the first grants from NIMH to do dream studies, collecting dreams by awakening subjects from REM sleep, offered me the opportunity to join his research group and we worked together until 1967. It was

with Roy that I began my work in dreaming that continues to this day and is the basis for this book. My friend Jerry Baum, M.D., who was associate chief of staff for research at the VA provided logistic support for me to open a sleep/dream laboratory and the Veteran's Administration provided grant support for my work from 1962 until 1984.

I closed my laboratory in Cincinnati in 1982 following the death of Dr. Levine and the retirement of Hal Hiatt and joined Ed Draper's department at the University of Mississippi in Jackson opening the first Division of Sleep in a medical school. I opened a laboratory at the VA hospital as well with Ed's support. The encouragement Ed offered and the support I got from the administration allowed my research to continue.

I returned to Cincinnati in 1984 to open a clinical sleep program at Bethesda Hospital, continuing my clinical work in sleep medicine and my research in dreams and dreaming. The hospital director, Tom Willburn, encouraged my work by providing space, staff, and funding. In 1999, I moved to New York City into retirement with clinical appointments at NYU and Albert Einstein College of Medicine and to a position as Director of Psychiatric Research at the Maimonides Medical Center in Brooklyn where my current chief, Marvin Lipkowitz, M.D., has fostered my continuing to teach and do research.

The course in Dream Translation, which to a large extent is the basis for this book, was developed while I was on the faculty at the Universities of Cincinnati and Mississippi. I continue to teach the course at Albert Einstein in New York and to my residents at Maimonides. I have enjoyed the opportunity the American Psychiatric Association has provided in allowing me to teach Dream Translation at the Annual Meeting for the past eight years. I am grateful to the residents and colleagues who have attended these presentations and provided such valuable feedback.

The colleagues I have met through the Association for the Psychophysiological Study of Sleep now the Sleep Research Society and American Academy of Sleep Medicine and the Association for the Study of Dreams now the International Association for the Study of Dreams have made the journey a wonderful and fulfilling experience. In particular, those dream researchers came to a conference in Cincinnati in 1967 funded by NIMH and remain friends to this day. When I look at the published proceedings of the 1967 conference, "Dream Psychology and the new Biology of Dreaming," I return to a time of beginning when we were all young and the departed have returned.

I want to thank a number of authors and publishers who have granted me permission to reproduce material from their work. Stephen LaBerge kindly granted me permission to quote a lucid dream of his from his book "Lucid Dreaming." The quotations from Freud's "The Interpretation of

Dreams” are with the permission of Basic Books Publishers. The dream material from my paper “Patterns of Dreaming” is with the permission of the publishers of the *Journal of Nervous and Mental Disease*. Alan Hobson, Ed Pace-Schott and Bob Stickgold were accepting, if not in complete agreement, with my paraphrase of their work. Tom Roth agreed to allow citations from our paper “Dream Translation” to be used. I am grateful to you all.

The colleagues, professional and technical, who traveled with me at various times in my “Sentimental Journey” have contributed to my education both personal and professional and I am grateful to you all. The best is truly saved for last, my life partner, Fradie, who tolerated and encouraged but never compromised, who provided us with the joys of the children, Ruthie, Danny, Mary, and Sammy, their spouses Asher, Judy, Jerry, and Roberta and the children’s children, Avishai, Yael, Nadav, Ilona, Hannah, Josh, and Max. The dream fulfilled is the family we have.

Milton Kramer

CHAPTER 1

Introduction

A. The Historical Interest in Dreaming

The traditional interest in dreaming is to be found in the folk beliefs of dreamers who apparently were intrigued by their nocturnal experiences and sought an explanation for them (Lincoln, 1935). In most circumstances beyond their control, the ancients invoked a supernatural explanation. It was believed, in many traditions, that the will of God, or of the Gods, was revealed through dreams. The interpretations offered by the Biblical Joseph to the Pharaoh that explained the meaning of the seven fat kine (cows) followed by the seven lean kine led to his release from prison and elevation to high office. Joseph attributed the dream interpretation not to his skills but that God had interpreted the dreams (Hertz, 1976). The revelations of the Prophet Mohammed, recorded in the Koran, came to him in dreams where he was visited by the Angel Gabriel who spoke to him of God's will (Dawood & Wyatt, 1991). The early church fathers became concerned about their congregants viewing all dreaming as a message from God (Sanford, 1968). They worried that the Devil might use the dream experience to mislead the believer. They recognized a distinction between dreams from above, from God, and dreams from below, from the Devil that could lead the dreamer astray (Van de Castle, 1994). To avoid the dangers of being misled by evil forces, the church fathers early on turned against dream interpretation and dream interpreters and vigorously discouraged any attention to the dream and especially to experiencing the dream as a revelation (Kelsey, 1968).

2 • The Dream Experience

People through the ages have looked to the dream experience as a possible predictor of future events. In an unpredictable world filled with capricious Gods, foreknowledge then becomes a highly desirable commodity and premonitory dreaming a way to obtain such knowledge. Alexander the Great had laid siege to Tyre but was undecided about moving against the city. He had a dream of a Satyr. His court magician interpreted this by dividing the word Satyr and concluding that the meaning was Tyre is yours (Hughes, 1984; Kelsey, 1968). This interpretation apparently strengthened Alexander's resolve and he attacked and conquered the city.

There was a possible premonitory dream that preceded the horrible air disaster that was the crash of an American Airlines DC-10 at Chicago's O'Hare International Airport on May 26, 1979 in which 275 passengers were killed. David Booth, a 23-year-old office manager in Cincinnati, Ohio had the same nightmare for 10 nights in a row. He heard the sound of large engines failing then he saw an American Airlines passenger plane swerve and roll in the air and crash into the ground in a red fire. David was deeply troubled by what he had experienced. "There never was any doubt to me that something was going to happen. It wasn't like a dream. It was like I was standing there watching the whole thing." On May 22, 1979, he called a psychiatrist at the University of Cincinnati, American Airlines, and the Federal Aviation Administration (FAA) office at the Cincinnati airport. The FAA took him seriously but couldn't match the site to his description. The FAA felt the description of the crash bore a striking resemblance to what David had described. Was it pre-cognitive or coincidence? For some the question is an open one.

The belief in the curative and revelatory nature of dreaming was accepted and utilized by the Greek physicians who were members of the Asklepiian cult (Meier, 1966). Asklepios was the Greek God of healing and his temples were places people came to be healed. Early on in the history of the Asklepiian temples, the patient came to the temple and slept there, generally in the open, and had a dream experience that was healing. The temple grounds had many testimonials from patients who had been healed. Later on in the history of the temples, the practice changed, some have said degenerated. The patient came to the temple and slept, often with the aid of a potion, and the temple priest-physician moved among the sleepers in costume. On awakening, the patient reported his dream to the priest who interpreted the healing prescription that the God had communicated through the dream. Dependence on the expert for interpretation occurs early in the history of the effort to understand the import of the dream experience.

The 2nd century work on dream interpretation entitled *Oneirocritica* by Artemidorus of Daldis (White, 1990) provides a more sophisticated approach on which to base an interpretation of dreams than the simple and

arbitrary substitutions of the dream books of the ancients. Artemidorus advised that the life circumstances of the dreamer be taken into account in guiding the interpretation including the identity, gender, age, marital status, financial status, ethnicity, health, and occupation, among other things. He believed in the premonitory nature of dreaming and used the outcome of his interpretations to underpin his interpretive approach. He warned to be cautious to separate dreams that can be taken at face value and those that are to be understood allegorically. Artemidorus recommended particular attention be paid to dreams with no obvious motivating force. He observed that dreams are often only a continuation of the day's activities and he believed that dreams are often prompted by bodily needs or recent psychologically significant events. Recurrent dreams were to be regarded as especially significant. Artemidorus exemplified an insightful and valuable approach that went beyond what was usual for his time and is in concert with a modern view of dreaming.

It was in the 18th century with the beginning of the Enlightenment that the shift began to occur in the West from supernatural to naturalistic explanations in our understanding of the world and of man in that world. We might expect that the explanation for the dream experience and what the experience means, if anything, would have a more naturalistic and less supernatural explanation. This was indeed the case and the dream experience came to be seen as a consequence of physiologic changes in the dreamer. Nevertheless a segment of the population maintained a belief in a supernatural explanation of dreaming. My colleagues and I undertook to survey a statistically representative sample of adults in a mid-American city, Cincinnati (Kramer, Winget, & Whitman, 1971). In addition to asking each participant for a dream report, they were asked whether they believed that dreams could be premonitory and predict future events. Some 5% of our respondents stated that dreams could foretell future events. Perhaps in a country that has been described as the most religious in the Western world that some 1.5 million of our fellow citizens may express a belief in the supernatural should not be a surprise.

Does the belief in the premonitory nature of dreaming manifest itself in other ways? It has been said that the major work on dreaming that has captured the public's imagination and has re-awakened and sustained an interest in dreams is Freud's magnum opus *The Interpretation of Dreams* (Freud, 1955). Freud had an interest in the occult, but he rejected the notion that the dream in a supernatural manner could predict the future. Books such as *Aunt Sally's Policy Players Dream Book* (Yronwode, 2003) and others like it reflect the general public's interest in looking to dreams for information about what will happen in the future. Beginning in the 1890s in the black communities in the United States, a lottery-like illegal

gambling game developed called “Policy.” The bets could be quite small, pennies, and the pay offs were 10 times the bet. The choice of the number to bet by the policy player often was chosen from a dream book such as Aunt Sally’s. The player would select the image from a dream he had and search the dream book for the number that was linked to his dream image. There has been some interesting speculation about the basis for the relationship between a number and a dream image. For example, the interlocking nature of 6 and 9 has been offered as the basis for relating 69 to sexual activity in dreams. Policy and particular numbers and images became so commonplace that they appeared in blues songs in the 1920s and 1930s. Illegal gambling expanded over time into the white community and control shifted to organized crime; the game was now called “the numbers.” Pay-offs were linked to numbers that appeared in the public domain such as the number of shares traded on a designated stock exchange and this helped maintain a belief in the honesty of the winning number. Interest in and the use of dream books that provided number equivalents for dream images remained high. I wonder if players in the legalized state run lotteries of today turn to current versions of Aunt Sally’s book. The ancient Egyptians used dream dictionaries with fixed symbols, e.g., the Beatty Papyrus III and the lottery player of today may well continue the same behavior. We have gone from the Beatty Papyrus (Van de Castle, 1994) to Aunt Sally’s over three to four millennia.

The other work that has sustained an interest in dreaming, as was noted earlier, was Freud’s *The Interpretation of Dreams*. It was written in the last decade of the 19th century and published in 1900. It was barely noticed when it first appeared and took eight years to sell out its first printing (Kramer, 1994). This was in contrast to the work of Darwin (Darwin, 2003)—*The Origin of Species by Means of Natural Selection*, published in 1859, which was an immediate best seller. Freud always felt that the dream book was his major work. Psychoanalysis went on to capture the popular imagination and became the preferred treatment for emotional distress, especially in the United States. Interest in understanding the forces in the unconscious, in the motives outside of our awareness that were the “true determinants” of our behavior and revealed what we really thought and believed, were eagerly sought. Freud had expressed the view that “The interpretation of dreams is the royal road to a knowledge of the unconscious activities of the mind.” This led psychoanalysts and later psychotherapists to encourage the reporting of dreams by their patients and to attempt through the use of the “free associations” of their patients to undo the dream work that created the disguise of the manifest dream that the patient experienced and reported. The therapist then could reconstruct the latent dream thoughts, the source of the manifest dream, that reflected the

true feelings and motivations of the dreamer. Carl Jung (Jung, 1964a,b), an early disciple, collaborator, and finally a defector from Freud, in his Analytic Psychology, saw the dream experience as essentially a compensation for the exaggerated waking maladaptive traits of the dreamer. He recognized in the dreams characters, actions, and symbols were expressions of both individual and universal aspects of the human condition (Jung, 1974; Jung, 1984). The dream for Jung was revealing of the dreamer's psyche and the task of the therapist was to grasp the meaning that was being expressed. Techniques such as the use of active imagination, amplification, and symbol interpretation were used in the search for the meaning of the dream. The value of this increased self-knowledge, this message to the dreamer from his unconscious, would be to enhance the development of the individuation process within the individual to become more self-actualizing. Alfred Adler (Adler, 1956; Schulman, 1969), an early disciple and the first major defector from Freud and psychoanalysis, in his Individual Psychology, saw the dream experience as providing the emotional motor power to support the dreamer's striving toward his fictive life goal. As the individual came to terms with the need for superiority in order to enhance his life style and solved his waking problems with courage and social interest, the need to seek fictive and simplified solutions in dreams would diminish and dreaming would decrease if not cease entirely.

A fascination with and a firm belief in the revelatory and healing nature of dream exploration resides currently in two relatively small groups of people. One is involved with the Association for Research and Enlightenment in Virginia Beach, Virginia, that has built their beliefs on the work of the spiritual healer and mystic Edgar Cayce (Cayce & Cayce, 1971). The other group has a "new age" orientation and may be seen as growing out of the ideas and themes that flowed from Esalen. This "new age" group has developed ideas around dream sharing, the intrinsic truthfulness of dreams, and the healing nature of the dream experience (Ullman & Zimmerman, 1979). Those involved with leading and participating in "dream sharing groups," so-called dream workers who generally are nonprofessionals, have come together with scientific researchers into the dreaming experience and formed the International Association for the Study of Dreaming.

The three major schools of depth psychotherapy, Psychoanalysis, Analytic Psychology, and Individual Psychology, in the first third of the 20th century placed a priority on the exploration of the dream experience in order to enhance an understanding of the dreamer. It is to be expected that psychotherapists would focus their attention on the dream reports of their patients and attempt to unravel the dream as it would facilitate an understanding and alleviation of the distress their patients were experiencing. Unfortunately, the basis for relating the dream experience to other aspects

of the dreamer's life was not on very sound ground (Fisher & Greenberg, 1977). The method for establishing meaning was left to the individual judgment of the therapist and patient. No systematic examination of the reliability of such judgments was undertaken. The linkage of the understanding gained from dream interpretation to other aspects of the patient's psychic life was described only in an anecdotal manner. The therapists' dream interpretive endeavor needed to be supported by reliability and validity studies as well as demonstrations of the linkage between sleeping and waking consciousness that would show the connection between the two. Otherwise the undertaking of dream exploration and interpretation would remain an arbitrary and idiosyncratic process even if an imaginative, entertaining and, at times, a helpful one.

B. The Dream Has Not Been Considered an Appropriate Topic for Scientific Study

There has long been a distrust of studying subjective states scientifically. Psychologists struggled for years to escape from the introspective approach championed by Titchener (Millon, 2004). The focus moved from a first person data source to a third person one, from a study of subjective states to the study of objective states that were not dependent on the vagaries of the experimental subjects' reporting. The view of the behaviorist psychologist Watson (Millon, 2004) that the proper data for study was solely the directly observable became the only acceptable scientific position. The paradigmatic experiment was to study the relationship between a stimulus given to a subject and the resultant response and to ignore any processes that might have occurred in the "black box" between stimulus and response in the mind of the subject. This paradigm would, of course, preclude a scientific study of the dream experience. Those interested in dreaming reported clinical anecdotes of dreams told by a patient in therapy or, in rare instances, a study of the dream content of a group of people. It was only when a highly regarded academic psychologist, Calvin Hall, turned his attention to dreaming and provided a method for quantifying the dream report (Hall & Van de Castle, 1966) that a scientific approach to the dream experience became possible.

The study of the mind was enlivened with the development of the cognitive sciences that were stimulated by the introduction of computers and the concepts related to artificial intelligence. Cognitive science (Gardner, 1985) is a collaborative approach involving psychologists, philosophers, linguists, neuroscientists, computer specialists, and anthropologists. The focus of these endeavors is directed at understanding waking consciousness, particularly rational thought, and did not include studies of emotion

or dreaming in their working agenda. Concomitantly, with this study of the mind and as a result of the discovery of various brain imaging devices, neuroscientists focused on brain localization studies linking various areas of the brain to observable behaviors. The view taken by those scientists who studied brain function was and continues to be that the important level of description for such an undertaking is biological rather than psychological. Patricia Churchland, a neurophilosopher, describes consciousness, of which dreaming is an example, as having its reality rooted in its neurobiology (Churchland, 2002). The view that consciousness is rooted in biology is captured in more specific terms by the neuroscientist Joseph LeDoux (LeDoux, 2002) when he says, “you are your synapses.” He proposes “a synaptic explanation of the self.” For many of these neuroscientists, the mind became epiphenomenal to the more fundamental brain processes (Hobson, 1988). *Traume sind Schaume*—mind, at best, became the foam on the beer that is the brain.

Some neuroscientists who became interested in consciousness were dismissive in their approach to the dreamer’s memory of the dream experience. Crick, a Nobel Prize winner for his work on the structure of DNA, saw the dream experience as a reflection of the process by which the brain rid itself of superfluous memories (Crick & Mitchison, 1983). This process was analogized by him to an offline clearance of data from a computer’s memory system to avoid an overload breakdown. He was of the opinion that dreaming dumped thoughts from the brain and thereby avoided the overloading of the brain’s memory capacity. This view of memory storage as similar to a storage facility with a fixed capacity does not square with our understanding of brain function.

Robert, in the 19th century (Freud, 1955), expressed a similar view of dream function, which Freud called the “excretion theory” of dreams, similar to that proposed by Crick. Robert describes dreams as “a somatic process of excretion of which we become aware in our mental reaction to it... A man deprived of the capacity for dreaming would in the course of time become mentally deranged, because a great mass of uncompleted unworked-out thoughts and superficial impressions would accumulate in his brain and would be bound by their bulk to smother the thoughts which should be assimilated into his memory as completed wholes. Dreams serve as a safety-valve for the overburdened brain. They possess the power to heal and relieve.” The interference with or the loss of the function of dreaming in the Robert/Crick scenario leads to a “locked brain” as interference with the gastrointestinal function of motility leads to “locked bowels.” The dream deprivation experience of the New York disc jockey Peter Tripp who stayed awake for 201 hours in a glass booth in Times Square as a publicity stunt and experienced a psychotic breakdown during which he hallucinated and

had persecutory delusions seemed to confirm the dangers of the loss of dreaming. Apparently Mr. Tripp had had a previous psychotic episode and the stress of the extended sleep deprivation appeared to trigger a reactivation of his disturbed mental state (Dement, 1974). Koranyi and Lehman had shown in a group of hospitalized, withdrawn, chronically ill schizophrenic patients that sleep deprivation reactivated their acute symptoms (Koranyi & Lehmann, 1960). As his science fair project in 1964, a 17-year-old high-school student, Randy Gardner, deprived himself of sleep and the accompanying dreams for 264 hours and did not become psychotic but showed impaired cognitive function and illusions. Some have challenged the rather benign description of the effect of the lengthy sleep deprivation on Randy and insist that he had transient psychotic symptoms (Ross, 1965).

The loss of the dreaming experience that is reported with certain types of localized brain lesions has as a consequence reports of disturbed sleep continuity not mental derangement (Solms, 1997). The disruption of sleep with the loss of dreaming is in keeping with Freud's view of dreaming as having a sleep protective function and does not fit the waste product model that is implicit in the Robert/Crick theories of dreaming which may be seen as dismissive of dreaming as an experience.

The study of the dream experience is the study of the dream report that is a first person, subjective report as was noted earlier. Science, in studying human behavior, has insisted on focusing on external observables as its object of study, what are termed third person reports. Even in studying cognitive processes when two alleged internal mind processes are compared what is measured is the time it may take to complete a task. For example, comparing on a mental map how long it takes using your mind's eye to go from New York to Chicago compared to New York to Los Angeles, the latter takes longer and the time difference is roughly proportional to the mileage differences (Kosslyn, 1980). The reluctance or refusal to study first person reports of experience, such as a dream, relates to a concern about the introspective ability of the subject to attend to and recall inner experiences and the willingness of subjects to report such potentially revealing and embarrassing thoughts as may occur in dreams. Given the vagaries of memory in the waking state such as are caused by transience, blocking, misattribution, suggestibility, and bias raises doubt about the dream report being a valid reflection of the dream as experienced (Schacter, 2001). I would suggest that science is not determined by what is studied but is a method of study. It has been advocated by Daniel Dennett (Dennett, 2005) that reports of conscious experience while awake utilizing the techniques and approaches of so-called third person scientific approaches are a legitimate approach to consciousness and I would suggest that as dreaming is a

form of consciousness that there can be as scientific an approach to studying dream reports as studying reports of waking consciousness.

C. Why Study the Dream Experience?

I have already discussed several reasons why people have been interested in the dream experience and might want to study dreaming more closely. These include the belief that dreaming is a mode that God chooses to communicate with people, the dream from above (Sanford, 1968). Another reason that serves to have dreamers pay attention to their dreams is the belief that dreaming has the capacity to predict the future, premonitory dreaming (Kramer, Winget, & Whitman, 1971). And, that attention to the dream experience may reveal significant aspects of the psychology of the dreamer, the revelatory nature of dreaming.

Those scientists interested in studying the mind are attracted to studying the dream report because it provides the opportunity to study an output of the mind in “pure culture,” relatively less constrained, less influenced by outside forces (Foulkes, 1978). For some investigators the study of the dream is seen as a window on the functioning of the brain, on the processes which determine the dream experience (Hartmann, 1984).

The discovery of REM sleep, which was considered to be the biological substrate of dreaming, has opened the possibility of collecting large numbers of dream reports at a given point in time so that experimental dream research becomes possible (Cartwright, 1972). The tools were already available to quantify the content of the dream experience. The Hall-Van de Castle dream content system, mentioned earlier, was one such quantification system (Hall & Van de Castle, 1966). The book I published with Carolyn Winget, *Dimensions of Dreams* (Winget & Kramer, 1979), is a compendium of many such quantification systems. It has been said that science begins with quantification. Being able to gather a large number of dreams and to measure them opens the possibility that investigators can engage in the scientific study of dreams.

We had been led to believe by such psychiatric and neurological greats as Sigmund Freud (Freud, 1955), Carl Jung (Jung, 1964b), and Hughlings Jackson (Jackson, 1958) that the study of dreams, the so called “sane man’s psychosis,” would unlock the mysteries of psychosis. Mental illness was considered a major public health problem at the time, 1952, when REM sleep, the alleged biological substrate for dreaming and perhaps of psychosis, was identified. Perhaps one-tenth of the hospital beds in the United States were occupied by patients with psychotic illnesses. Psychiatrists were attracted to studying the dreaming process in the laboratory as it might enrich their understanding of how to more effectively use dreams

in therapy and shed light on the psychotic process. I believe we learned a great deal about dreaming in our studies of dreams, but unfortunately less about psychosis and we did not unlock the mystery of psychosis. Julius Axelrod, the Nobel Prize winner, pointed out that in supporting the beginning studies of nor-epinephrine in depression, we would learn a lot about nor-epinephrine even if we didn't learn all we would have liked about depression.

The discovery of REM sleep with its often replicated strong correlation to dreaming opened the possibility of resolving the mind-body problem that had preoccupied religionists, philosophers, and scientists since Descartes' formulation of the intrinsic difference between bodily states and mental states in the 16th century (Descartes, 1912). Descartes' dualistic theory of the nature of man deeply troubled those scientists who in the 18th century resolved to explain biology with the same mechanistic modalities or forces that were used elsewhere in sciences such as in physics and chemistry. Their materialist approaches led to rejecting the vitalist explanation for the difference between animate and inanimate things and to reject teleological explanations for bodily activities (Millon, 2004). It was hoped that the formerly unbridgeable could be united now that we were armed with the REM/dream correlation (Hobson, Pace-Schott, & Stickgold, 2000).

In the modern era, two major theories have addressed the biological basis of dreaming claiming to a greater or lesser degree to have resolved the Cartesian division. The earlier so-called AIM State model of dreaming is an expanded version of his activation-synthesis theory proposed by Allan Hobson and his colleagues (Hobson, Pace-Schott, & Stickgold, 2000). The other biological dream theory is the neuropsychological brain lesion theory of dreaming offered by Mark Solms (Solms, 1997). All biological theories of dreaming are unable to provide the transduction rules to go from neurons firing in the brain to the conscious experience of dreaming (Kramer, 2003). They are reductive in trying to explain psychology by biology. They focus only on the syntax (form), not the semantics (content, meaning) or pragmatics (function) of dreaming. They may posit the brain chemistry of dreaming, which is not directly measurable in humans. And they do not account for the narrative aspects of dreaming. The biological theories of dreaming will be discussed later (Kramer, 2000).

Correlation lets us stand on one or the other shore of the Cartesian divide and perhaps view the other side. Predictive validity might allow us to set foot on the bridge to begin the crossing, although some philosophers, called "Mysterians" by Owen Flannigan (Dennett, 2005), doubt we have found or will ever find the bridge over the divide (McGuinn, 1999). Our view of the nature of the world so commits us to reject the Cartesian