

Sleepwalking Disorder and *Mens Rea*: A Review and Case Report

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ABSTRACT: This paper examines complications of sleepwalking disorder (DSM-IV 307.46), an arousal disorder or parasomnia, in relationship to *mens rea*, or culpable mental state necessary to a finding of criminal responsibility. The legal history of criminal intent and insanity is reviewed. A case of indecent exposure is discussed in a man with a history of closed head injuries and sleepwalking disorder who was found standing naked in the middle of a busy urban thoroughfare in the wee hours of the morning and arrested. On psychiatric evaluation, the defendant was found to have a long-standing sleepwalking disorder. At trial, scientific literature and psychiatric expert testimony concerning sleepwalking disorder was presented. The psychiatrist opined that the defendant was probably sleepwalking at the time of the alleged offense. No rebuttal testimony was offered by the prosecution. The jury found the man not guilty. The author surveys the legal history of sleepwalking disorder and compares this example with others in which uncontrolled behavior during sleep has resulted in harm to the patient or to others. Clinical and forensic implications of the disorder are reviewed. The parasomnias' impact on forensic practice should be systematically studied. Intervention strategies should be refined and implemented.

KEYWORDS: forensic science, criminal competence, criminal intent, criminal responsibility, forensic psychiatry, indecent exposure, *mens rea*, parasomnias, psychiatric evaluation, sleepwalking disorder

Around 2 a.m., (Soviet Communist Party Chief Leonid) Brezhnev's bodyguard, standing watch near his bedroom in the courtyard just across from Nixon's apartment, saw the door of the President's quarters open. His wife Pat appeared in a long nightgown, her hands stretched forward and her eyes fixed in the distance, apparently in some kind of trance. She reached our bodyguard and stopped, saying nothing. The guard attempted to turn Mrs. Nixon around, but she refused to move and stood stiffly. After some hesitation the Soviet guard, an officer of the KGB, took Mrs. Nixon in his arms and carried her back to the room from which she had just emerged; it was her bedroom. He put her back in bed, and at just that moment the Secret Service arrived. They waved, smiled, and said to our man, "OK, OK, thanks." They did not seem all that surprised.

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Then-First Lady Pat Nixon's early-morning stroll is an evocative example of the embarrassment and hazard which may complicate the wanderings of those afflicted with a parasomnia colloquially referred to as "sleepwalking." Sleepwalking Disorder (DSM-IV 307.46) has imperiled life and limb of patients and those around them. Although some case law relates to Sleepwalking Disorder, there is little medical literature in which it was an element in the assessment of so-called *mens rea*, the guilty knowledge of contemplation of commission of a crime (criminal intent) (2). This paper reports an incident involving Sleepwalking Disorder which provoked a charge of indecent exposure and reviews the relationship of neuropsychiatric impairment generally and Sleepwalking Disorder specifically to the psychiatric assessment of *mens rea*.

Definition of a Crime

Actus Rea

Society has since ancient times molded manners by defining which behaviors are "wrong" and setting forth appropriate penalties. What is "criminal" varies widely from culture to culture. Early penal codes made no distinction between unintentional and purposeful acts. Today, a criminal act, or *actus rea*, in order to satisfy the legal definition of a crime in the United States, must be paired with a culpable mental state, or *mens rea*, characterized by the knowing intent to commit a crime. By way of illustration, one may adduce the National Institute of Justice's definition of fraud as "the deliberate intent (*mens rea*), targeted against individuals, to deceive for the purpose of illegal financial gain (*actus rea*) (3)."

Mens Rea

Absent culpable mental state gives rise to a defense to prosecution. This notion that the wrongdoer's mind has bearing on the wrongfulness of his act is in no way modern. Hammurabi, King of Babylonia (2123-2081 BC) codified law based on Sumerian antecedents now 6000 years old. The Code of Hammurabi, although blending enlightened regulation with barbarous punishment, varied largely in *how* rather than *whether* the malefactor was to be put to death (e.g., the knowing deceiver was thrown to almost certain death by drowning in the Euphrates, the art of swimming being unknown in Babylonian times.) The Code did, however, consider the intent of the accused. Reverend Johns, early 20th-century scholar, informs us that unintentional offenses were given lesser punishments or ignored altogether (4).

A sampling of L. W. King's elegant translation of The Code supports Johns' assertion: ¶206 speaks of intentional harm: "If during a quarrel one man strike another and wound him, then he

shall swear, 'I did not injure him wittingly,' and pay the physicians." ¶227 says "If anyone deceive a barber, and have him mark a slave not for sale with the sign of a slave, he shall be put to death, and buried in his house. The barber shall swear: "I did not mark him wittingly," and shall be guiltless." The duped barber, being unwitting, survived to ply his trade (5). Driver and Miles' interpretation of ¶251 specifies that "If an ox be a goring ox, and (the owner's) district has made known to him that he is a gorer, and (the owner) do not bind his horns, or fasten the ox up, and the ox gore a free-born man and kill him, the owner shall pay one-half a mina in money (6)." Thus, its owner was held responsible if he had reason to know the animal was vicious. So old is the phrase "knew or should have known." A multitude of allusions to intent in The Code suggests that the idea of "knowing intent" was an established legal concept several millennia before the common era.

The funeral Papyrus of Ani from the late XVIIIth dynasty (ca. 1450 BC), carries the notion of intent, as Egyptians did with so much else, into the afterlife. The Papyrus describes the decedent Ani's spiritual purity showing his heart (symbolizing what we today consider soul and mind) weighed against the feather of the Law, Maat. "O Lord of Amentet," Ani prays to the god of the underworld, "I have not lied wittingly, nor have I done aught with a false heart (7)." Whatever evil he has said or done, Ani proclaims to gods and readers, it was unwitting, without knowing intent.

Classical Greek myths provide early Western representations of the relationship between mental impairment and the *actus rea*. For example, the Greeks not only excused Heracles' murderous ways but placed him in their pantheon: "He married Megara, daughter of Creon of Thebes, and tried to settle down; but Hera sent a madness upon him, and unwittingly he killed his own children . . . then, killed his own friends by accident. After his death he was worshipped as hero and god (8)." Our mighty killer is exonerated of responsibility for slaughtering friends and children simply because he was free of culpable mental state.

Although Ani pled that he didn't know of wrongdoing, Heracles was stricken with lunacy by a jealous goddess (at least with his infanticides) so that he *couldn't* know. It is upon this relationship between mental derangement and absence of knowing intent to do evil that our modern concept of criminal responsibility—or lack thereof—is founded.

Anglo-American formulation of absent criminal responsibility based on mental disorder found its early legal synthesis in the 19th-Century English case of Daniel M'Naghten, whose paranoid hegira and murder of Mr. Peel will not be recounted here. The Court's ruling that Mr. M'Naghten was not guilty by reason of insanity outraged Queen Victoria, who posed certain questions to the Law Lords, who responded with a legal definition of criminal incapacitation. This "M'Naghten Rule" still influences our judicial process a century and a half later: An offender is not responsible for his *actus rea* if at the time of his offense he was "labouring under such a defect of reason, from disease of the mind, as not to know the nature and quality of the act he was doing; or if he did know it, that he did not know he was doing what was wrong (9)."

There are a number of legal "lenses" through which insanity may now be scrutinized. "Insanity" as used in the 19th-century M'Naghten Rule of the British House of Lords is a term of art signifying inability to accomplish either one or both mental tasks: 1) discernment of the nature and quality of one's acts, and 2) differentiation between right and wrong. This incapacity must

derive from a mental disease or defect, excluding voluntary intoxication or antisocial personality disorder. The "product" rule, set forth in *Durham v. United States*, held that the test of insanity lay in the question of whether the *actus rea* was the "product" of a mental disease or defect (10). This was supplanted when *U.S. v. Brawner* espoused the American Law Institute (ALI) Model Penal Code, which holds a defendant not criminally responsible if "as a result of mental disease or defect he lacks substantial capacity either to appreciate the criminality [wrongfulness] of his conduct or to conform his conduct to the requirements of the law (11)." There are many jurisdictions which use the ALI insanity test.

Neuropsychiatric Impairment and Criminal Insanity

If the issue of criminal capacity is raised, courts must resolve the question one way or the other. This is not always easy for psychiatrists drawn into the process as experts. There is a lingering misconception that criminal insanity is similar to psychosis deriving from major mental disorder. Meloy warns that it is erroneous to assume that an offense occurred during a psychotic state simply because the accused has a history of psychosis, or that evidence of psychosis during the offense dictates a finding of loss of reality testing commensurate with criminal incapacitation (12). This persistent error dies hard in the minds of mental health clinicians inexperienced in the reasoning of the law. This may be, as Torcia argues, because there is an inherent conflict between legal and clinical approaches to the problem: ". . . a psychiatrist has difficulty working with a legal test which assumes that a subject is either sane or insane; it is more in keeping with a psychiatrist's discipline to characterize subjects as normal or abnormal to varying degrees (13)."

This apparent disharmony between law and medicine becomes resolvable if the question is framed in terms of cognitive jobs or acts which must be done—mental illness set aside for the moment—in order to attain legal responsibility. An insanity defense may have three elements: 1) presence of mental disease, 2) lack of cognition, and 3) lack of volition (14). There are, however, jurisdictions which do not include the volitional issue.

Legal insanity by any criteria is not the same as psychosis, schizophrenia, delirium, or any mental disease or defect, although mental disorders may cause criminal incapacitation. Appelbaum and Gutheil point to M'Naghten's problematic definition of impaired mental function based on "knowing" as it applies to wrongfulness (15). For example, a psychotic patient may assault someone in obedience to command hallucinations informing him that the victim is the devil's agent and must be destroyed to save the world. That same patient, while actively psychotic, may readily acknowledge that murder in the abstract is wrong. In this instance, the patient, believing his assault to be in the service of saving the world, is arguably unable to know the nature and quality of his act (planetary salvation versus murder) or that it was wrong.

Such a defendant, however, may by ALI standards, not lack the substantial capacity to appreciate the criminality of his act. On the other hand, he may be significantly impaired in his ability to conform his behavior to the requirements of law.

An offender may be severely mentally ill while no M'Naghten or ALI impairment exists. Illness is assessed by history and symptoms, whereas the law gauges behavior according to legal standards like the M'Naghten rule, which makes no diagnosis. A grandiose manic, for instance, may believe that the rules of law, which he fully understands, have been especially suspended in his case. Here, judgment may be the only impairment. In the author's experience,

acquired in a jurisdiction where M'Naghten applies, the rule has been a poor legal guide in this diagnosis, and many a patient with bipolar disorder has gone to prison for acts which he/she would never commit had he/she not been manic at the time of the offense. One is tempted to speculate that clinicians would be more comfortable with a "product view" of manic miscreants in that their impulsive unlawful acts may arguably be considered a product (symptom) of their affliction.

For the forensic psychiatrist, then, there is a lack of definition surrounding questions of responsibility in mentally impaired offenders whose consciousness is present but deranged. By contrast, the clinician is guided with uncommon clarity—no matter what legal standard applies—when consciousness is absent. Sleep is a paradigm of this neurologic state.

Sleep Disorders

There are three normal physiologic brain states: wakefulness, REM sleep, and non-REM sleep, each having different neurophysiologic activity. This includes different brain responses to auditory and thermal stimuli and to hypoxia in each of these three states (16). Healthy human sleep cycles between REM and non REM sleep over the course of 70 to 120 min. Sleep onset normally progresses from wakefulness through the four successively deeper stages of non-REM sleep to REM sleep.

Parasomnias are adverse events occurring during sleep, of which partial arousal from deep sleep may be among the more troubling, and sometimes dangerous. Arousal disorders occur most frequently during the first third of the night and are exacerbated by stress, anxiety, and sleep deprivation (17). Two common arousal disorders arising from slow wave sleep are Sleepwalking Disorder and Sleep Terrors. Many a mother is familiar with the night terrors of childhood. Sleepwalking Disorder is a cultural paradigm of loss of control.

Sleepwalking Disorder

Symptoms

Diagnostic criteria for Sleepwalking Disorder are set forth in DSM-IV (18). The Disorder is characterized by repeated episodes of complex motor behavior initiated during slow-wave sleep, usually during the first third of the night (Criterion A). A sleepwalker's reactions to stimuli are greatly reduced; his/her unresponsiveness is characterized by a blank stare, usually coupled with an inability to communicate with those who try to awaken the individual (Criterion B). Upon awakening, the sleepwalker has amnesia or very limited recall of episodic events (Criterion C). Often there is brief confusion or difficulty orienting (Criterion D) when the individual is awakened directly from a sleepwalking episode. Clinically significant distress or impairment in vital areas of functioning or social interaction may be involved (Criterion E). The Disorder cannot be due to the direct physiological effects of a substance (e.g., drug abuse, a medication) or a general medical condition (Criterion F).

The sleepwalker's demeanor may range from mild to bizarre. Mild episodes (sometimes called "confusional arousals"), can involve things the sleepwalker would normally do while awake, such as getting up, roaming around, using the bathroom, eating, talking, and going outside. Frantic attempts to escape unseen threat may occur, or the patient may unlock doors or operate machinery (e.g., Y and P.H., *infra*). Sleepwalkers are ordinarily difficult to arouse, as in Ambassador Dobrynin's account of the late First Lady.

Prevalence

Between 10 and 30% of children have had one sleepwalking episode. Adult prevalence of the full Disorder may be as high as 7% of the general population and appears to be independent of culture or gender. Family members of sleepwalkers have an 80% reported incidence of some form of arousal disorder. Children of two biological parents with Sleepwalking Disorder have up to 60% risk of developing the disorder. Violence and injury of self or others is more likely in adults and appears to correlate with sleep terror symptoms as the patient attempts to escape or attack some unknown horror.

Course

Sleepwalking episodes usually start between four and eight years of age, although it has been reported as early as the child learns to walk. Prevalence peaks around 12, with most cases resolving spontaneously in adolescence. Adult onset is rare. In adults whose childhood Sleepwalking Disorder persists, the course follows a chronic, waxing and waning pattern which may be influenced (*infra*) by medication, alcohol, or stress. It is tantalizing to realize that Watergate had broken out prior to Pat Nixon's nocturnal encounter with the KGB. She may well have been highly stressed. The case of Y illustrates the pattern quite well.

Case History of Mechanic Y

Y, chief mechanic at a motorcycle shop, was 38 years old when he was arrested for indecent exposure in the wee hours of the morning. Just prior to the arrest, Y's common-law wife, L, had gone to bed, after which he fell asleep in the living room. At about 1:15 in the morning, the driver of a truck pulled up next to a police officer sitting in his patrol car parked at the curb of a major urban thoroughfare. The citizen pointed down the street and said that there was a naked man near an apartment complex, drinking a beer. Proceeding to the location, the officer found Y standing alone and stark naked in the middle of the street, sipping a can of beer. Fortunately, traffic was light at that hour. The officer turned his spotlight on Y, who seemed startled and ran back to his apartment.

After waiting for backup, the officer knocked at Y's door. L answered and Y came out dressed in a robe. Y explained that he had been "sleepwalking." He had been startled by the spotlight in his eyes and had run when he realized he had no clothes on. Y did not know how he got outside, why he was drinking a beer, or why he was out on the street naked. The last he remembered was going to sleep in a living room chair—with no clothes on—having just taken a shower.

Y was arrested on a misdemeanor charge of indecent exposure, released on bail and bound over for city court trial. Unable to afford a private attorney, he was assigned counsel from the city public defender's office, a public agency with limited funds. In light of Y's claim that he had been sleepwalking at the time of his alleged offense, funding was approved for evaluation by a forensic psychiatrist (TNT), who urged without success that Y also undergo neuropsychological assessment and polysomnography sleep laboratory assessment.

The psychiatrist performed a psychiatric examination of Y in his office and conducted a telephone interview of L to obtain collateral information. From these sources and from the police record, a history was synthesized.

Y, a male Caucasian born in a small town near the Mexico border, had no significant complications of gestation or birth. At

age four, he sustained a closed head injury when struck by a car. After an unknown number of days in coma, Y recovered and was discharged from the hospital. Y recalls no subsequent school or behavioral problems for several years after that. However, at about age twelve, his mother would occasionally tell him that she had found him sleepwalking. He had no memory of these episodes, which occurred at varying frequency ranging from less than ten to a few dozen times each year.

In early adulthood, Y was shot in the head but survived. A .22 slug remains lodged in the outer table of the left frontotemporal aspect of his skull. Y does not believe this new injury influenced his sleepwalking in frequency or manifestation.

Y's first and second ex-wives continued to describe sleepwalking and talking in his sleep. In the year she had known him, L had on several occasions slept out in the living room because Y talked so loudly in his sleep. Y described complex behaviors while asleep. Once he woke up having worked on a motorcycle and had to rebuild the engine because he had done it all wrong. Episodes tended to occur shortly after Y fell asleep, beginning with talking in his sleep followed by increasing restlessness after which he tried to get out of bed. L had observed Y become assaultive while sleepwalking (e.g., pummeling the bedroom door when Y was unable to leave). In 19 of 20 episodes that she is aware of, L stopped Y from walking outside. Y was arrested after the 20th.

Prior to his arrest, Y's paycheck and L's retirement check were late and he was stressed by overdue bills. L observed that, when he got upset, Y tended to talk in his sleep and to sleepwalk more often. There was also a correlation with alcohol consumption in the evening. L and Y hypothesized that these factors may have provoked a sleepwalking episode the night of his arrest, because he had consumed part of a beer to calm his nerves that evening.

L flatly stated that she knew of no sexual aberration in Y. He was very prudish, not even wearing shorts in public, and was certainly not in the habit of exposing himself. Y did acknowledge an arrest for burglary when he was 18. He claimed he hadn't transgressed since then. There was no record of sexual crimes of any kind.

On examination, Y presented as cooperative and of normal mental status in all respects. There was no evidence of cognitive impairment, psychosis, or other mental disorder. His life pattern seemed stable and no personality diagnosis was made. Y had no history of drug abuse. He denied a pattern of alcohol consumption having legal or social consequences. Y seemed rather phlegmatic and did not attempt to magnify any symptoms. In fact, he did not know he had a formal neuropsychiatric disorder, although he knew that sleepwalking was colloquially recognized. Malingering was thought to be unlikely.

Y adequately comprehended the proceedings against him and understood the roles of the various personæ involved therein. Y understood his Constitutional rights and the significance of a plea agreement. He was deemed competent to stand trial.

Y's probable mental condition at the time of the alleged offense was Sleepwalking Disorder. This somnambulant state had left Y completely unaware of the nature and quality of his acts or that they might be wrong. There was little to suggest that Y had a paraphilia or sexual impulse disorder as he did not fit the profile for a sex offender. The forensic psychiatrist submitted a written opinion as to the nature of Y's mental state at the time, and was surprised to learn that the matter was going to trial. He was informed by defense counsel that the "sex offender" aspect of the charge made it impossible for the prosecutor's office to decline prosecution without appearing "soft" on sex crimes.

At trial, the arresting officer admitted that he had failed to question L about any sleepwalking habits but did ask her whether Y ever ran around outside naked, which she categorically denied. Although there was an odor of alcohol on Y's breath, no field sobriety tests were administered. Although he had seen Y drink beer in the street, the officer could not testify to any signs or symptoms of alcohol impairment. Similarly, no breathalyzer data or blood alcohol level (BAL) were taken.

The psychiatrist opined that Y's history, including the temporal relationship to sleep onset and his symptoms, were characteristic of Sleepwalking Disorder. The psychiatrist presented a sampling of the current literature on the parasomnias, and sleepwalking disorder in particular. Alternative theories such as paraphilias that might explain the alleged offense were considered and rejected as inconsistent with available evidence and history. No rebuttal expert was offered by the prosecution.

After several hours of deliberation, the jury found Y not guilty. Post trial interview of a juror who was a practicing attorney revealed that the jurors were confused as to why the charges had not been dropped. If Y was sleepwalking at the time of his alleged offense, then they could not convict him. They considered whether he knew or should have known that he was at risk of sleepwalking but concluded he was not charged with negligence. They found the psychiatrist credible but gave no weight to the scientific literature upon which his opinion was partly founded.

Discussion

These jarlmen made ready for sleep, unwitting that new terror
and woe lurked outside in the night.
Beowulf (19)

Clinical Implications

It is always helpful to consider alternative diagnoses in the clinical and forensic venues. Y had no history of compulsion to expose himself in the past. Deviant sexual fantasies, for example, tend to arise as early as 12 or 13, and are fully formed at least by early adulthood. Also, amongst paraphilics, there is an astonishingly high frequency of repetition (20). Absent recent additional brain insult, onset of paraphilia in the fourth decade of life was deemed unlikely.

Nocturnal behavior similar to that which led up to Y's arrest has been amply described. Berlin and Qayyum point out that the typical sleepwalking episode occurs in the first three hours of sleep, when slow-wave sleep stages 3 and 4 (non-REM) predominate (21). Although poorly coordinated ambulation is the rule, complex activity that is clearly out of context, such as dressing, eating, or urinating, may occur. Kavie and co-workers describe a woman who called her sister and conducted what seemed to be a reasonable conversation during a somnambulistic episode. Another woman took all her shoes out and lined them up on the window sill (22). Y's "rebuilding" of his motorcycle engine is exemplary of the degree of complexity recounted by other authors.

Maselli and co-workers reported on 12 non-epileptic patients with no history of psychiatric or neurologic disorder, who experienced episodic sleepwalking beginning with attacks of screaming followed by complex, often violent automatisms (23). Episodes ranged in frequency from two or three in a year to several each night. When subjected to polysomnography, four patients showed

temporal lobe spikes on their all-night EEGs. Seven out of nine patients treated with anticonvulsants had complete cessation or dramatic reduction in the severity of somnambulistic episodes. The authors concluded that this population reflected “a distinct clinical entity that can be defined by the presence of stereotypic nocturnal attacks and uniform age (childhood through adolescence) of onset.”

As Y’s history portrays, sleep disorders, once considered petty, even amusing annoyances, should be considered potentially dangerous. Hartmann asserts that the peril to sleep-disordered patients of all types includes fatal sleep apnea, crib death, and fatal accidents in narcolepsy if a sleep attack occurs while the patient is driving (24). Hayes and Grunstein affirm this hazard in Sleepwalking Disorder: “The most important aspect of treatment in managing night terrors and sleepwalking is to prevent injuries. This may necessitate removal of furniture or dangerous objects from the room and possibly special latches on doors and windows (25).” Berlin and Qayyum also share this view: “Since genuine risk of physical injury exists during a sleepwalking episode, the parents should be instructed to provide a safe environment . . . the child should sleep on the first floor . . . dangerous objects should be removed . . . windows and doors should be locked, and stairways should be gated (26).” Although these admonitions may at first blush seem Draconian, several reports in the literature suggest this is not so.

Maselli’s group recorded multiple contusions and fractures among their patients (27). Kavie et al. documented frequent self-injury incurred during violent somnambulistic episodes; one patient dislocated a shoulder upon diving out of bed. The authors concluded “the potential for serious injury or death is illustrated by one patient who walked out onto the window ledge of his 35th-floor apartment (28).”

Patients may not stay on the ledge. Mahowald and colleagues have identified a “dangerous sleep-related disorder, the rapid eye movement (REM) behavior disorder,” (RBD) which has resulted in cervical fractures, severe lacerations, and other injuries (29). People have gone so far as to tie themselves to the bed to prevent their going out of the window. Mahowald et al. found “firm documentation that sleep-related behaviors of diverse etiologies may result in dangerous automatic behavior with forensic science implications . . . The commonly held belief that somnambulism and night terrors are benign and do not result in injury is clearly erroneous. The accompanying behaviors may be violent, resulting in considerable injury to the individual, others, or damage to the environment (30).”

Hartmann described the case of P.H., a man with Sleepwalking Disorder since childhood, who started up his car an hour after he had pulled over to the side of the highway to take a nap. The patient drove the wrong way down the road and collided head-on into an oncoming vehicle, killing three people. Subsequent psychiatric evaluation revealed that P.H.’s nocturnal episodes had increased in frequency after a promotion, with its attendant stresses. He occasionally drank to deal with this, and had consumed five or six cocktails prior to starting his drive. BAL after the accident was over 200 mg/dL, 100 mg/dL being the upper limit for legal driving in Arizona. P.H. quit drinking and took a less responsible position. He reported one episode of sleepwalking in the following year, although he still talked in his sleep at times (31).

It would appear, then, that Y is fortunate that he has not sustained worse complications of his Sleepwalking Disorder than an embarrassing legal contretemps. If convicted, he would have been obliged to register as a sex offender for the rest of his life. On the other

hand, Y has not hurt himself or anyone else while sleepwalking. Unfortunately, despite the forensic psychiatrist’s recommendation for further assessment and treatment, Y remains untreated, and may well fall in harm’s way or put someone else in it.

Evidence suggests that Sleepwalking Disorder may be provoked or exacerbated by drugs or alcohol. Glassman and co-workers reported a schizo-affective patient whose sleepwalking began only after the addition of a potent anticholinergic agent (benztropine) to his regimen (32). The patient’s brother had one sleepwalking episode after consuming a CNS-active drug. Berlin and Qayyum record a panoply of drugs, alcohol, and combinations thereof which are associated with sleepwalking. These include but are not limited to lithium, thioridazine, chlorpromazine, and amitriptyline (33). Lauerma asserts the potential for triazolam and other short-acting benzodiazepines to provoke sleep disorders, including nocturnal wandering (34).

In addition to biochemical insults, neurological problems, head trauma among them, may disrupt sleep (35). Kavie and co workers described a sleepwalker who had a skull fracture at age seven (36). We do not have definitive BAL data on Y but, as is often seen with Sleepwalking Disorder, there is historical correlation with alcohol consumption. On the other hand, Y’s head injuries as potential causal elements are not wholly established. Most patients with sleepwalking disorder don’t have head injuries. Secondly, the bullet in Y’s head had no impact on his sleep patterns.

Psychological stress is increasingly recognized as *agent provocateur* in Sleepwalking Disorder. P.H.’s tragedy (*supra*) began with the stress of a promotion. Lillywhite and co-workers studied a patient whose childhood sleepwalking reappeared as she dealt with a bad marriage but improved with divorce (37). The weight of clinical reports strongly supports Y’s perception that his sleepwalking is exacerbated by stress.

It is true that polysomnography may provide “hard scientific” evidence of Sleepwalking Disorder but Berlin and Qayyum assert that sleep laboratory studies are superfluous to accurate diagnosis. Many sleepwalkers may be in good health, and have no findings on mental status evaluation or on polysomnography. A careful taking of psychiatric, medical, and sleep histories from the patient and from collateral sources may be the sole means by which the affliction can be identified (and this is in no way peculiar to sleep disorders). Family members, parents, spouse, or significant others must be included in the investigation of parasomnias whenever possible. Lillywhite and his group have gone so far as to involve bed partners in the identification of arousal episodes during all-night sleep studies of their patients (37)! The importance of L’s collateral history in supporting the legitimacy of Y’s diagnosis of Sleepwalking Disorder—and therefore of his affirmative defense at trial—cannot be overstated.

Forensic Implications

As the territory between psychiatry and law becomes more heavily trodden, the olden shibboleth that *legal* insanity equals insanity is fast yielding to a broader view. We read of delirious patients’ assaultiveness, of paranoia of the profoundly hearing impaired leading to physical conflict, and more recently of derangement of sleep in relationship to behavioral transgression. There are a few Anglo-American precedents. Morris cites *Fain v. Commonwealth*, 78 Ky. 183 (1879), in which Fain’s manslaughter conviction was reversed on appeal (38). He had shot a porter who was trying to wake him up after he had fallen asleep in a public room in the hotel. The court held that Fain was entitled to show

that he was a somnambulist and had fired the gun under a full or partial somnambulistic state. If proven, this would have precluded a finding of voluntariness of the homicidal act, which would not be punishable under any law.

One might imagine *Fain* to be extraordinary, if not singular. However, there are multiple lay and medical reports of killings and mayhem by sleepers. For example, before his literary ascendancy, James Joyce and his companions were almost killed by their sleeping roommate, Samuel Trench, who in the throes of a night terror snatched up a revolver and shot at the fireplace beside which Joyce was sleeping. Joyce got up, dressed and walked to Dublin, miles away, never to return (39).

Joyce et al. were lucky. Brody documents more tragic outcomes in three recent cases: 1) A 16-year-old girl, dreaming of intruding burglars, shot and killed her father and 6-year-old brother and wounded her mother; 2) A vacationing French detective, called upon to conduct an impromptu investigation of an apparently motiveless homicide, figured out that he himself had shot the man with his pistol while sleepwalking; 3) A 23-year-old Toronto man, under stress and suffering from severe insomnia, arose in his sleep, drove his car to the home of his mother-in-law, whom he loved and who called him a "gentle giant," entered the home and stabbed her to death (40). The legal outcome of the French case is unknown. The Kentucky girl and the Canadian were acquitted.

Their acquittal may be equated to a *mens rea* defense which removes criminal responsibility by a showing of absent criminal intent. As with *Fain* and his unfortunate successors, no insanity need be asserted if this absence can be shown. Sleepwalking can remove the required *mens rea* for a crime. In jurisdictions which do not permit a *mens rea* defense, Sleepwalking Disorder can effectively satisfy the criteria for an insanity defense.

Morris provides a sampling of penal codes illustrating the elements of criminal responsibility in relationship to sleep (41). California's 1970 Penal Code (§26) held that "All persons are capable of committing crimes except . . . (those) who committed the act charged without being conscious thereof." The 1979 Illinois statute (Ch. 38, §4-1) asserted that every offense was founded on a "voluntary act," from which the 1962 proposed draft of the Model Penal Code (§2.01) had excluded "a bodily movement during unconsciousness or sleep."

Recent judicial opinion has drifted away from the notion of a "mental" defense to prosecution. Miller has reviewed the heated debate on whether the insanity defense should exist at all, citing Supreme Court Justice Thomas' view that there should be no real distinction between verdicts of guilty and not guilty by reason of insanity (42). This reductionist view is troubling; it is difficult to imagine the sleepwalker as a convicted felon.

Given the ample discussion of sleepwalking in the literature, it is surprising that so few of those afflicted with Sleepwalking Disorder have found their way onto the shifting sands of the judicial system. This may manifest the very nature of sleep, which in our culture is pursued within closed structures that would ordinarily protect the sleepwalker and others from potential harm, notwithstanding the nocturnal travail described above. As the homeless population rises that may change.

Y's amnesia for events leading up to his awakening in the street is consistent with his past history and conforms to clinical descriptions of other workers. It is important to note that his criminal *competence* was never called into question. Following *Wilson*, Y's memory of his alleged offense was not absolutely essential because the case was not overly complex and alternative reliable information was available (43). He was fully capable of assisting counsel in reconstructing what must have happened. This

is hardly unexpected in light of the low psychiatric co-morbidity which may prevail in Sleepwalking Disorder. Forensic experts, who almost never witness crimes about which they offer expert opinion, are faced with the same absence of first-hand observation. One can nonetheless arrive at a defensible opinion.

Mahowald et al. have considered the question of how these complex and injurious behaviors can arise in the absence of wakefulness (44). They point out that extensive animal experimental studies show that "the widely held concept that the brain stem and other more primitive neural structures primarily participate in elemental/vegetative rather than behavioral activities is inaccurate. There are overwhelming amounts of data documenting that extremely complex emotional and motor behaviors can originate from these more primitive structures—without involvement of 'higher' neural structures such as the cortex (45)."

This is an important awareness, from the promulgation of which the forensic community would no doubt profit. The paucity of forensic precedent involving Sleepwalking Disorder may reflect a lack of mindfulness on the part of clinicians and counsel concerning the pathophysiology of the sleep-wake cycle. Most members of the bar with whom the author has been privileged to consult have been insightful, even perspicacious with respect to the workings of the conscious mind. They may not be attuned to its vagaries during sleep. The author hastens to say that forensic clinicians are often untrained in sleep medicine, a discipline which didn't exist when the author was in residency. There is a hopeful note in the experience of Mahowald and co-workers, who in their jurisdiction routinely receive court and social service referrals specifically for evaluation of sleep-related violence (45). They caution, however, that diagnosis of a specific sleep/violence condition does not establish causality of a violent act. Following their example, psychiatrists are even more compelled to vigilance for the infrequently recognized malady like sleepwalking disorder. Differential diagnosis of mental state is, after all, their *métier*.

This has immediate relevance at trial. Limitation of funds for Y's trial was compensated for by reliance on historical diagnosis given verity by collateral history and the literature. However, had Y's affirmative defense based on Sleepwalking Disorder been hotly contested, the absence of definitive polysomnography results could have redounded very seriously to his detriment. For all that, the author postulates that Y would satisfy M'Naghten, ALI, or Durham product criteria for exculpation were his diagnosis to be accepted by the trier of fact.

Conclusion

There is a need for study and education focused on the parasomnias and their relationship to the law. Post *Daubert* forensic experts bear an even greater onus to rigorously diagnose them according to well-established criteria (46). Richardson et al. question whether some psychological syndromes and theories are not inherently inconsistent with *Daubert* concepts like "falsifiability" and "error rates (47)." There has been little commentary on how *Daubert* will apply to mental syndromes. Sleepwalking Disorder will perhaps be more acceptable in this "scientific" judicial climate because known physiology plays a greater role in its definition than does, say, Borderline Personality Disorder. Also, literary discussion, although an element of *Daubert* admissibility, may have little impact on juries like Y's. Further research is needed to clarify the divergence between judicial and juror perception in this area.

Potential social costs are unknown. Although Hartmann did not report legal ramifications for P.H., (*supra*), one would not be astonished to learn of civil or criminal proceedings. Funds for Y's

police investigation, pre-trial incarceration, prosecution, defense, expert investigation, and the judicial process came entirely out of public coffers. Taxpayer expense was not insignificant. Thomas has reviewed other incidents in which the authorities had sufficient information to close the investigative dossier without proceeding to prosecution and its attendant costs (48). This seems to have been the situation with Y. This is unfortunate, because investigative and judicial resources, always limited and often inadequate, expended on doubtful matters are taken from others in which evidence of guilt is more forthcoming.

Only anecdotal commentary is available with regard to potential morbidity and mortality of Sleepwalking Disorder. Although adult prevalence has been calculated, more attention to accurate estimation of injury and death rates is required.

Diagnostic modifications by Lillywhite's group are encouraging (49). These authors have moved the sleep laboratory into the home, using ambulatory EEG equipment and impressing the patient's bed partner into the role of "clinical observer." The authors assert that the obvious logistical simplification may be augmented by higher efficiency, because it often takes several nights of "acclimatization" in a sleep laboratory before patients return to their regular sleep pattern. Such innovation is rare. It should be aggressively emulated.

Treatment of Sleepwalking Disorder is largely descriptive at this juncture. Clinical reports suggest helpful approaches to the problem. However, clinical management remains ill-defined and subject to confusion. Understanding of putative causal elements is lacking. For example, clonazepam and benzodiazepines generally have been posited as causal and recommended as treatment (because of slow wave sleep suppression). Schenck et al. have given credence to clonazepam as an effective intervention in their series of 100 patients with RBD (50). Nonetheless, they recommend an annual drug holiday to assess the underlying sleep pathology.

There may be new pharmacologic tools in the offing. The work of Armitage and her colleagues, who have shown nefazodone to decrease arousal episodes, and of Lillywhite's group (*supra*), which successfully treated night terrors and Sleepwalking Disorder with paroxetine, are hopeful harbingers (51). Controlled studies should be effectuated to define the efficacy of current techniques and to evolve new approaches to diagnosis and treatment. Considering the demonstrable potential lethality of sleep disorders—balanced by the likelihood of response to treatment—clinicians who include them in their differential will do so to the profit of their patients, and possibly that of a defendant.

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ERRATA

ERRATUM 1

The word “*Rea*” was inadvertently transposed as “*Era*” in the Table of Contents for the paper “Sleepwalking Disorder and *Mens Rea*: A Review and Case Report” published in the *Journal of Forensic Sciences* 1997;42(1):17–24 by Thomas N. Thomas.

ERRATUM 2

The correct labeling for the Figure 7 of the paper “An Update on the Use of the Sodium Rhodizonate Test for the Detection of Lead Originating from Firearm Discharges” published in the *Journal of forensic Sciences* 1996;41(6):1046–1050 by Michael R. Bartsch et al. Should be as follows:

- (a)ii should be (b)i
- (b)i should be (b)ii
- (b)ii should be (a)ii