Chapter 15

CONVERSION DISORDERS

EDWIN A. WEINSTEIN, M.D.*

Consultant in Neurology, National Naval Medical Center, Bethesda, Maryland; Consultant in Psychiatry, Walter Reed Army Medical Center, Washington, D.C.; and Formerly Chief, Fifth Army Neuropsychiatric Center (World War II)

Aaron Bohrod *Tent Hospital* 1943

Aaron Bohrod was engaged as an artist by the War Department Artist's Advisory Committee and was in the South Pacific, England, and France during World War II. In this painting, he captures the variety of patients seen in a field hospital. Of particular interest is the patient in the wheelchair—slumped down, arms completely limp, head back, vacant stare—a soldier who has seen too much and cannot even move himself into an upright seated position. He presents as a classic conversion disorder with the obvious conflict between his desire to serve and his invalidism which prevents it.

Art: Courtesy of US Center of Military History, Washington, DC.

INTRODUCTION

Although ideas of hysteria and conversion disorders have changed radically over the centuries, almost all have emphasized emotional and physical traumas and their effects on the brain or mind. While the incidence of conversion reactions has declined in developed countries, the occurrence of the condition in association with violence and stress makes it particularly relevant to military medicine. Military approaches have been shaped by concepts derived from civilian practice, and, in turn, wartime experiences have contributed greatly to current theoretical formulations. This chapter provides a historical review of conversion disorders in wartime, considers epidemiological and demographic aspects, examines psychological, symbolic and neural factors, and takes up problems of differential diagnosis and treatment.

A conversion disorder, as defined by the Diagnostic and Statistical Manual, 3rd edition, of the American Psychiatric Association (DSM-III),[1] is a loss or alteration of physical functioning suggestive of physical disease but expressing a psychological conflict or need in a nonvoluntary fashion. In practice, the term is limited to findings on neurological examination that imitate neurological disease, but do not conform to anatomical or physiological patterns. It includes paralysis, somatic and special sensory disturbances, involuntary movements, pseudoseizures, speech, gait, and memory disorders, and excludes symptoms referable to the gastrointestinal, cardiorespiratory, and genitourinary systems. Broadly, the symptom can be seen as the symbolic representation of some problem or disability. Conversion disorders are differentiated from hysterical personality, somatization disorder, hypochondriasis, and psychogenic pain. Pain, however, is commonly associated. The terms conversion disorder and hysteria will be used interchangeably here depending on contemporary reference.

HISTORY

The Civil War

By the middle of the 19th century it had been recognized that hysteria was a disease of the mind and the brain, but it was still considered a female malady. The gender difference was variously attributed to reflex irritation from the uterus and ovary, to women's greater sensitivity, emotionality, and impressionability, which made them more sensitive to the effects of fear, excitement, grief and jealousy, and to sexual repressions and frustrations. Both abstinence and overindulgence were invoked as causes. Hysteria was known in men, but only in those who were effeminate or homosexual. Authors also emphasized heredity, citing mental illness and diseases such as epilepsy and syphilis.

Against this background, it is not surprising that cases of hysteria were not recorded in the Civil War, in which the major neuropsychiatric disabilities were nostalgia, soldier's heart, and insanity. A review, however, of individual cases in the medical journals of the day suggests that a considerable number of the 28.3% of discharges for epilepsy, and of the 20.8% for paralysis involved conversion disorders.[2] One such case was that of a 28-year-old recruit who, after an altercation with an officer while seeking to desert, became unable to move any of his limbs. Subsequently, he developed violent tremors of his head and upper extremities. Pressure on the soles of his feet produced saltatory arching of his back. On attempting to walk he would take a few powerful and ungoverned steps and then throw himself on a bed. He was discharged from service with a diagnosis of choreic convulsion, and, 2 months later was reported to be completely recovered.[3]

Further evidence for the existence of conversion disorders in the Civil War comes from the records of the military hospital set up at Turner's Lane in Philadelphia by William A. Hammond, Surgeon-General of the Union Army, for the study and treatment of wounds and other injuries of the nervous system. There, Silas Weir Mitchell and his colleagues, George D. Morehouse and William W. Keen,[4] described seven cases of "reflex paralysis" which were almost certainly conversion reactions. In these patients a missile wound of an extremity which had not damaged a major nerve resulted in a transient paralysis of all four limbs or an enduring weakness and sensory loss in several extremities. In one instance, a man who had been shot through the right thigh developed a loss of sensation over the entire right half of his body. Patients responded

to faradic stimulation but only up to a point short of complete recovery. Mitchell had studied in Paris, then the leading center of neurology in the world, and was familiar with the manifestations of hysteria. He may have considered the diagnosis as he mentioned the case of an officer in the Mexican War who had become "almost hysterical" after having been shot through the heel. The officer, however, had a reputation for courage under fire and it was an article of faith that hysteria did not occur in strong men not weakened by indulgence in sex, alcohol, or tobacco.[4]

After the Civil War

The decades following the Civil War may be regarded as the golden age of hysteria. The condition was romanticized in Victorian novels, and provided the central theme for the concepts of mental illness put forward by Paul Briquet, Jean-Martin Charcot, Pierre Janet, and Sigmund Freud.

Briquet[5] found that hysteria occurred predominantly in lower-class women who led lives of hardships and poverty, rather than among the privileged groups of society. Taking up the role of sexuality, he compared the incidence of hysteria—as diagnosed by the standards of the time—in chaste nuns, female domestic servants (who might supplement their incomes through sexual accommodations), and professional Parisian prostitutes. He discovered the highest rate in prostitutes and the lowest in nuns, with servants in between. Briquet concluded that the significant agent was not sexual indulgence per se but the distressing conditions under which the activity was carried out. He thought that emotions such as fear and grief affected the part of the brain which was the seat of feelings and that this in turn produced the hysterical symptom.

Jean-Martin Charcot[6] believed that a past psychological trauma could affect the function of the cerebral cortex, and produce such hysterical disorders as aphonia, hemiplegia, and seizures. He showed that symptoms could be both produced and removed by suggestion, and regarded susceptibility to suggestion and hypnosis as evidence of hereditary weakness of the nervous system. Charcot thought that a volitional element might be present and emphasized the need for discipline in treatment. He urged that patients be isolated from their families and from others with hysteria to provide a better moral environment. Charcot and his followers, known as the school of La Salpetriere, stressed the so-called stigmata of hysteria, such as ovarian tenderness, pharyngeal and corneal anesthesia, and concentric constriction of the visual fields. Joseph Babinski, one of Charcot's pupils, believed that hysterical hemianesthesias, and other manifestations were artifacts of the neurological examination produced by unconscious suggestion by the physician.

Pierre Janet,[7] another of Charcot's disciples, believed that the traumatic event occurred in a setting of altered consciousness or trance state, and was not integrated into conscious awareness. The dissociated ideas and affects produced the hysterical symptoms. Janet thought that chronic disease, organic affections of the nervous system, psychic weakness, and a succession of cumulative emotional effects made the individual more vulnerable to dissociation.

John Russell Reynolds[8] in London proposed that a hysterical paralysis was caused by the *idea* of a paralysis and the emotion associated with it and by a loss of the will to move the limb(s), and that treatment depended on the removal of that idea. Reynolds noted that in men the hysterical manifestations frequently came on after a fall from a horse or other accident, and that in women idleness, preoccupation with domestic matters, and frigidity were the principal factors. He also remarked on the association with organic brain disease and physical illness.

Joseph Breuer and Sigmund Freud[9] in 1895 cited such emotional traumas as guilt over a father's illness, unrequited love, and remorse over the wish to marry a dying sister's husband. They found that hysterical symptoms brought on by even minor upsets or injuries could be traced back to traumas early in life for which the memory and associated affect had been repressed. After Freud gave up the seduction theory—the idea that the origin of hysteria lay in the sexual abuse of children—he held that the original trauma involved emotions connected with the child's own sexual and aggressive drives. These affects and memories were converted into somatic symptoms in order to maintain a constant level of energy in the nervous system. The hysterical manifestation, in Freud's view, was the expression of sexual gratification along with efforts to suppress it, although he agreed that nonsexual impulses might be involved.[9] He later was to attribute the traumatic neurosis of World War I to the narcissistic attachment of the libido to the ego, engendered not only by fear of battle but by reactivation of the castration complex. Freud, like others, believed in a hereditary factor, noting that one half of his patients with hysteria and psychasthenia (ie, obsessions and phobias) had a syphilitic father.

Briquet, Charcot, and Freud had all described hysteria in female patients. It was, however, not until the rapid industrial growth following the Civil War, particularly the expansion of the railroads and the advent of compensation legislation and litigation, that the existence of male hysteria in the form of the traumatic neurosis was generally recognized.

A man who had been shaken up or bruised in a fall or a railway accident would complain of pain and inability to move his legs, and examination would show tenderness over the spine, and apparent paralysis and anesthesia below the waist. At first these findings were attributed to injury of the spinal column, or to concussion or anemia of the spinal cord, but the observations of Herbert Page, surgeon to the London and Northwest Railway, and James J. Putnam of Boston established the functional nature of the condition. By 1895, James Hendrie Lloyd, writing in Francis X. Dercum's authoritative textbook on nervous disease, could state that next to heredity, trauma was the most important cause of hysteria and that some of the worst cases occurred in men. Others thought that patients with railway spine were malingerers and, like Weir Mitchell, did not accept the existence of male hysteria until World War I.

World War I

Conversion disorders, along with neurasthenia (ie, anxiety and exhaustion), were the leading categories of neuropsychiatric breakdown in both combat and noncombat situations in World War I. There were 6,250 cases, representing an incidence of 1.53/1,000/y of total strength, admitted to U.S. military hospitals from 1 April 1917 to 31 December 1918.[10] Although Congress declared war in April 1917, it was more than a year before U.S. troops engaged in significant combat, and the data are derived mainly from British, French, and German sources.

In the early years of the war, ideas of hereditary and acquired predisposition to the effects of shell shock provided explanations of conversion disorder and neurasthenia. Frederic W. Mott, a British medical officer in charge of a large hospital in London, was the leading advocate of the view that the concussive action of the shell explosions caused minute brain hemorrhages, and that the large majority of men who broke down after such an experience had inborn neuropathic or psychopathic tendencies, a family history of alcoholism, insanity, or epilepsy, or a timorous disposition.[11,12] The French differentiated the contusional effects of shell explosions with focal neurological signs and bloody or xanthochromic spinal fluid, from the commotional or concussional effects, and from the emotional sequelae.

It was soon evident that conversion reactions occurred in men who had not been in the immediate proximity of an exploding shell. They appeared in soldiers who had undergone terrifying and life-threatening experiences, such as witnessing scenes of death and mutilation or undergoing torpedoing at sea. They were more apt to appear in places of relative security before the opening of a barrage, or after a man had reached a clearing station rather than in the midst of combat. Conversion reactions also occurred after relatively minor trauma—a slight wound, bruises, or burns. It was not uncommon for the conversion symptom to come on days, weeks, or even months after the reported trauma, after what Charcot had referred to as a *phase de meditation*. There was a very low incidence of traumatic neurosis in prisoners of war.[13]

British, French, and German observers noted that conversion reactions were more common at base installations than in forward or combat support areas. Eder[14] found that 77% of patients at a British hospital in Malta were so classified. U.S. experience was similar in that there was a higher rate of hospital admissions for conversion disorders in men who had never left the continental United States than in those who had served overseas.[10] Among patients in General Hospital No. 3 set up in Plattsburg, New York for the treatment of war neuroses, conversion disorders outnumbered other categories combined.

The significance of preexisting constitutional factors was a controversial issue in the German as well as the Allied armies. At the German Neurological Congress held in Munich in September 1916, R. Gaupp presented the case for predisposition, while M. Nonne was the leading advocate of the view that the cause of the war neuroses lay less in the personal constitution than in the nature of the trauma. Working in hospitals in Hamburg and Schleswig Holstein, Nonne found that the "hysterical character" was lacking in the majority of his cases.[15] Hurst[16] found many cases of gross hysterical symptoms in British soldiers who had no family or personal history of neurosis and who were perfectly fit up to the time of the traumatic incident. It should be noted that the original British Army in France was made up largely of volunteers. Even Mott stated later in the war that premorbid factors were important only in neurasthenia.[11] Rather than occurring in men with timorous dispositions, many conversion disorders were observed in noncommissioned officers and enlisted men with good combat records,

and in daredevil types who had volunteered for hazardous assignments such as dispatch rider, stretcher bearer, or sniper.

Both British and American data indicated a marked difference in the incidence of conversion disorders in commissioned officers and enlisted men. The British found that the symptoms displayed by officers were predominantly of the neurasthenic type, while enlisted men had mainly hysterical manifestations. In the British Army, rank was an indicator of social class, and it was believed that the forces of education, tradition, and example in the officer groups made for greater self-control and better ability to resist a sudden breaking emotion or trauma.[17] In the U.S. Army, disability discharges for hysteria in officers were four times less frequent than those for neurasthenia, whereas in enlisted personnel the ratio was approximately equal.[10]

Conversion symptoms included mutism and stammering, deafness, gross tremor and other involuntary movements, paralysis and anesthesia, abnormal postures and contractures, astasia (an inability to maintain stance), abasia (an inability to coordinate movements in walking), and other gait disturbances, seizures, amnesia, and fugue states. In the French Army paraplegia and monoplegia were the most frequent forms of paralysis.[18] Blindness was less common than blurring of vision and blepharospasm. It was usual for soldiers to report having been blown up or buried after a shell explosion, and then having no memory of events prior to arriving at the clearing station. There were episodes of excitement and delirium for which the soldier would later be amnesic, and periods of stupor often preceded muteness, deafness, and paralysis. The type and location of the conversion manifestation was frequently determined by the character of the trauma. Astasia-abasia, the most common conversion manifestation of the war, occurred frequently in men who had been thrown violently to the ground and who had rolled into a trench or hollow and had been able to get to an aid station by laboriously walking or crawling.[18] Hemiparesis might be preceded by an injury to that side of the body. Paralysis or contracture of a limb might follow a local wound, or might come on after a period of immobilization in a splint, sling, or cast.

A large number of cases, sometimes in epidemic proportions, followed gas attacks. Chlorine and mustard gas caused conjunctivitis making it painful for the man to close his lids, produced irritation of the throat, larynx, and bronchial tree, and resulted in gastritis from swallowed saliva. These symptoms usually cleared within 2 to 3 weeks, but some soldiers developed hysterical blindness, ptosis, aphonia, vomiting, and respiratory difficulty. (Adolf Hitler became blind and mute for several weeks after having been exposed to mustard gas in the last days of the war, and may well have had a hysterical disorder.) Gas neurosis epidemics also occurred after desultory gas shelling or even after an alarm had been erroneously sounded, even without evidence of inhalation or vesicant action.

Problems in diagnosis arose. Prior to the war most physicians who had been engaged in private practice or administrative work were not familiar with the traumatic neuroses. Early in the war, cases of conversion disorder were considered to have organic disease and were evacuated to the neurological centers in base areas where they might be treated with rest, hydrotherapy, and other measures which perpetuated the symptoms. It was also shown that patients with evidence of brain damage could have conversion manifestations.[16,19] Moreover, such stigmata as hysterogenic zones (ie, areas of anesthesia or tenderness on the back or abdomen, concentric constriction of the visual fields, and corneal and pharyngeal anesthesia) proved to be unreliable indicators.[15,16] As Babinski had found, narrowing and spiraling of the visual fields were frequently an artifact of the examination of the perimeter of men who had no visual symptoms. Similarly the classical *la belle indifference* (being indifferent to the situation) might not be present.

Treatment included suggestion, persuasion, explanation, reeducation, hypnosis, and more physical measures such as isolation and deprivation, faradization (stimulation by electrical current), and sedation. Hypnosis was used with suggestion, and also in attempts to recover repressed feelings and memories. Psychotherapy strove to encourage catharsis, and deal with feelings of grief, shame, fear, anger, and guilt. The overall experience was that the efficacy of whatever treatment was employed increased with proximity to the front and the promptness with which it was applied. While hysterical manifestations might be removed at a base hospital, the majority of such cases did not return to successful combat duty. The soldier might develop headaches and other manifestations of anxiety or depression, or his conversion symptom might return during some frightening situation, such as a London air-raid.[17,19] The British found that amne-

sia, mutism, and paralysis responded readily as did gas hysteria, while deafness was the most intractable.[20] The American experience was that symptoms which occurred in conditions in which there had been a definite trauma or acute emotional insult succeeded by a stage of amnesia or dissociation had the best outcome.[10]

The French, in the tradition of Charcot and Babinski, regarded conversion disorders not as diseases but as failures of will or attitude. Conditions such as mutism, trembling, and paralysis were treated first by persuasion and encouragement, and if these measures were inadequate, by isolation and bed rest without permission to read, write, or smoke. If cure still had not resulted, painful faradic stimulation, *torpillage* (*torpille* = torpedo [numb fish]) was applied. Inveterate hysterics were regarded as malingerers and might be subject to court-martial.[18] The French were the first to treat such "emotional" cases in forward areas, a policy not adopted in the British Army until the winter of 1916 to 1917.

There were also cases in which conversion symptoms cleared after some emotional shock as in the instance of a man with hysterical blindness following torpedoing whose sight returned after he was thrown into the sea. Another man suddenly regained speech during a bombing raid by Zeppelins.[17]

The observations of conversion disorders in World War I can be summarized as follows:

1. The conversion symptom was often a reenactment or symbolic representation of recent traumatic experience.
2. Trauma was a necessary but not sufficient agent in that the incidence did not depend on the severity of the injury or emotional insult.
3. Symptoms might come on at a considerable interval following trauma and persist in chronic form.
4. Social class and education were significant factors in that the incidence was greater in enlisted men than in commissioned officers.
5. Individual predisposition was not a factor in the sense that men who developed conversion disorders had had more mental illness or were of a more timid, nervous temperament.
6. Many forms of therapy were effective provided that they were administered promptly and in close proximity to the soldier's unit.

World War II

There was little academic interest in conversion disorders in the decades following World War I. The condition was thought to be disappearing because of greater sophistication and sexual liberation—actually a decline in incidence and less dramatic presentation had been noted at the turn of the century—but other factors were involved. Nineteenth century physicians had focused on the physical stigmata of mental illness, whereas later ones were more concerned with psychological mechanisms. New neurological procedures such as the introduction of the Babinski sign and the delineation of the functions of the parietal lobe led to better diagnosis. A number of the manifestations of conversion disorders were placed in the growing category of psychosomatic disease. Patients with conversion symptoms, who tended to be less educated and more apt to come from rural areas, were not considered good candidates for psychoanalytically oriented therapy, and were likely to be treated by local practitioners or referred to public clinics.[21,22] Compensation traumatic neuroses were not considered worthy of scientific study.

Theoretical formulations, despite the experience of the war, were for the most part reiterations of Freudian concepts. These emphasized intrapsychic struggle and regression to earlier stages of psychosexual development. Little attention was given to current trauma which was regarded mainly as a trigger of hitherto repressed drives and conflicts. Hypnosis fell into disuse, as it was felt that symptom removal did not touch the deeper problems. It was also believed that conversion symptoms might serve as a defense against a psychosis.[23] Nonanalytically oriented psychiatrists saw the issue as a conflict between the instinct of self-preservation and the demands of society without regard for situational factors and group interactive processes.

Conversion disorders were much less common in World War II than they had been in World War I, but they made up a significant proportion of neuropsychiatric casualties. Comparisons are difficult because revision of nomenclature had removed the somatic manifestations of anxiety and cardiorespiratory, gastrointestinal, and genitourinary symptoms from the conversion reactions. The rates as a consequence of combat varied with the intensity of the fighting, the location and expertise of the medical facility, and the conditions of evacuation. Reports from combat support areas in Italy[24] and

Normandy and Germany[25,26] showed an incidence of about 5% of neuropsychiatric casualties. The incidence among men evacuated to one hospital in the South Pacific 4 to 6 weeks after the onset of symptoms was 17%.[27] A British report of neuropsychiatric casualties admitted to a rear-area installation during the retreat to El Alamein and the advance into Tripolitania gave an incidence of 26%.[28] After a study of documents and interviews with former Wehrmacht psychiatrists, Schneider[29] concluded that conversion manifestations such as trembling and paralysis were common in the German Army.

The conversion manifestations matched those of World War I with paralysis of limbs, bizarre postures and gaits, involuntary movements and seizures, muteness and stammering, hearing and visual loss, and amnesia. There were also the stupors and other acute dissociative reactions, referred to as pseudopsychoses in which men experienced episodes of agitation, hallucinations and paranoid ideation, and performed such stereotypic activities as digging foxholes with their fingers, and taking shelter under cots at any sudden sound. These reactions occurred predominantly in young soldiers new to their units. Swank,[26] on the basis of his experience in Normandy and Germany, noted that hysterical paralyses and anesthesias occurred more frequently in airborne troops with good combat records than in other U.S. Army personnel and that the manifestations were almost always superimposed on a wound, injury, or surgical procedure. Swank found that all of his cases showed emotional tension rather than the traditional *la belle indifference*.

Symptoms were also occupationally determined. Anderson[30] noted that airmen developed complaints which did not totally incapacitate them, but which did not allow them to carry out certain types of operations. The symptoms included reduced visual acuity, impaired depth perception, diminished night vision, and altered hearing. These caused minimal discomfort, but disqualified the man from formation and night flying and from use of the intercommunication system. In many instances flyers could hear everything perfectly well with the sole exception of the radio beam. Blindness and concentric visual field constrictions were rare. The disability might be stated in terms of performance rather than symptoms as a patient might complain of difficulties in gauging distances when flying in formation.[31] Similarly, hysterical amblyopia was observed to appear suddenly in soldiers in whom the eye was particularly important in fighting, such as sharpshooters.[32] The following is an account of an acute combat conversion reaction.

Case Study 1: One More Shot

A 23-year-old infantry staff sergeant was admitted on a litter to the 601st Clearing Company in June 1944 during the fighting about Grossetto, Italy. His right arm was paralyzed below the elbow with a corresponding anesthesia. He stammered and said he could not see objects on his left side, and could not recall the first three digits of his serial number. He could recall nothing since being blown up and buried in a shell explosion. He expressed great fear that he would be killed. After examination which did not show a hemianopia or organic weakness or sensory loss, and assurances that he would recover, he was placed in isolation. When interviewed 8 hours later he was markedly improved. He could move his arm, talk clearly, and walk without assistance. He told the following story.

"First day of battle I shot a dago eight times because he shot at me. I guess I must have just lost my head. We dug in and went to bed. I was with the Armd. Div. [Armored Division] riding tanks—three of my men got killed by shells then just this side of Rome. We took Grossetto—took a hill, man hit me with a rifle butt [scar in left supraorbit] that scared me—I killed him with a bayonet—that bothered me, my father taught me never to kill—he's an invalid; he's a Christian man too….[W]alked some more, kept going north into the mountains. Got pinned down, shelled for 2 hours, killed two of my men and a lieutenant. Got to a little town; Battalion Commander lost his head, ordered four men in; he got nicked then ordered us to withdraw. Then went on tanks that shelled us [weeps], killed my lieutenant …[m]y platoon leader was hit, I was in charge. I ordered my men out. I stopped to take one more shot. I heard the Germans holler FIRE in English and that's all I remember until they picked me up in a jeep. My gas mask and shoulder straps had been shot off. Then I went to sleep and don't remember anything until this morning. The gun was blown out of my hand, all that was left was the trigger part. I guess the flash must have blinded me."[24(p135)]

Comment: The case illustrates a number of features:

1. The manner in which the symptom is a condensed symbolic representation of current experience rather than a revival of some childhood conflict.
2. The relationship of the site of the conversion manifestation to the type of physical injury.
3. The amnesia in which soldiers commonly reported that they remembered nothing from the time they were "blown up" in a shell explosion and "buried." As noted in World War I, actual burial incidents were infrequent although soldiers might be covered with debris. Rather the "burial" symbolized fear and feelings about death.
4. The coincidental occurrence of recovery and a dramatic account of traumatic experience.

5. The association of a conversion reaction with a high degree of anxiety.

As in this patient, some men with conversion reactions responded to suggestion and a period of sleep and isolation. In others hypnosis and the techniques of narcoanalysis[33] or narcosynthesis[34] were used. Each aimed at restoring the memory of the combat experience and allowing the ventilation of the affect. If the patient was amnesic it was suggested after the injection intravenously of sodium pentothol or Sodium Amytal that he go over the events immediately preceding the period for which he had no recall. If there was no amnesia he was asked to revisualize the scene just prior to the onset of his symptoms.

The recall or revisualization was usually associated with marked emotion and excitement. Events would be reenacted vividly: patients would yell, cower in fear, or strike at an examiner who was apparently mistaken for an enemy or a hated officer. In the method of narcosynthesis described by Grinker and Spiegel the examiner would simulate the sounds of combat, mimicking the antiaircraft fire and the shouts of the bomber crew. Or if it was known that the soldier was in a tank unit he would be warned that his tank was on fire and he had to climb out. Even though the patient might recall events for which he had been amnesic, the therapeutic effects seemed to depend on the degree of emotion displayed.

It was noted that patients might abreact with the introduction of the drug even though no suggestion that he recall the trauma was made. Also, the events that were reproduced were not necessarily those that preceded the onset of amnesia or other conversion manifestations. Recollections might be highly melodramatic with a mixture of fact and fantasy.[24,35,36] In a case treated by the author at the U.S. Army's 601st Clearing Company in Italy, the patient who had become dramatically blind "recalled" how he had been searching for his brother among the dead and wounded. He later admitted that his actual brother was safe in the United States.

As in World War I, once patients had been evacuated from their units, removal of a major conversion symptom by any method did not in most instances result in a successful return to combat duty even though in some cases soldiers asked to go back. It did, however, diminish the need for further hospitalization, and the majority of such soldiers could be released for noncombat service. By the end of the Italian campaign, the use of barbiturates at the U.S. Army level had been reduced. If symptoms persisted, despite attempts at abreaction, the patient was placed in an isolation tent with minimal privileges and told when his nervous condition cleared up he would be assigned to less hazardous duty. If these measures failed, the man was evacuated to a base section installation, where electroconvulsive treatment was effective in treating amnesias, mutism, seizures, astasia-abasias, deafness, and hyperkinesias.[37]

The experience of the Holocaust emphasizes the importance of motivation and secondary gain. Despite the terror, the gruesome conditions, and the appalling amount of physical injury, conversion reactions in the concentration camps were almost unknown. Eitinger, a Norwegian psychiatrist, who was a prisoner himself, commented on their rarity in Auschwitz where the appearance of a symptom meant instant death.[38] Kral[39] noted a few cases in Terezin that occurred while prisoners were awaiting transportation to extermination camps further eastward. Later studies of survivors showed a high incidence of brain damage and post-traumatic stress disorder.[40]

Korea and Vietnam

Rates of conversion disorders along with those for other psychiatric casualties were lower in Korea and Vietnam than they had been in World War II. In Vietnam, character and behavior disorders and substance abuse predominated, and the incidence of conversion reactions appeared to vary with proximity to combat. Jones,[41] who served with an infantry division and field hospital in Vietnam, remarked on the rarity of both combat fatigue and conversion reactions, while a higher rate was suggested by Carden and Schramel[42] who saw their 12 patients after they had been evacuated to the Philippines. In a temporal frame, while the overall combat casualty rate reached its peak in 1968 and 1969, the incidence of conversion disorders continued to increase, reaching a 1975 high of 95/100,000/y in patients in U.S. Army medical facilities worldwide, followed by a steady decline.[43]

A prior wound was an important risk factor both for conversion reactions and other psychiatric disorders among U.S. Marines.[44] In U.S. Army personnel, Jones noted, similarly, that *conversion manifestations were apt to appear when a wounded hospitalized soldier was about to return to duty.*

DEVELOPMENTS AFTER WORLD WAR II

Whereas the combat experience of World War I had little impact on psychiatric thought, that of World War II profoundly affected developments in areas relevant to conversion disorders. These concerned the:

1. Psychological and physiological effects of stress and violence associated with traumatic life events in persons without prior personality disorders or unusual emotional problems. These include assaults and injuries, rape, medical and surgical illnesses, natural catastrophes, political terrorism, family violence, and death of a loved one.
2. Concept of denial as a coping mechanism during and following trauma. Prior to the war and the Holocaust, psychoanalysis had focused on the denial or repression of unacceptable inner drives. Denial of external reality was considered to be indicative of severe psychopathology or a weak ego. The war experience showed that denial could be used by normal persons in adaptive—or maladaptive—fashion. The soldier who was well-integrated into his unit perceived the hostile environment as less life-threatening than the man who had little confidence in his leaders, and was otherwise not identified with the values of his group. When, however, denial of danger was expressed in a failure to follow safety procedures, it became highly maladaptive. In concentration camps it was observed that prisoners who could deny the inevitability of death by selective inattention and emotional numbing, and carry on by helping others, were most likely to survive. Those who expressed denial by escape into day dreaming and by not accepting the grim realities soon perished.[38]
3. Dissociative states such as feelings of depersonalization, derealization and detachment from one's body, and amnesia and fugues, which, like denial, are commonly associated with trauma. Patients with multiple personality have a high incidence of conversion disorders.[45]
4. Development of procedures and methods of study which established the organic nature of conditions once thought to be of hysterical origin, such as the focal dystonias, reflex sympathetic dystrophy and transient global amnesia.
5. Investigation of the roles of brain damage and cerebral hemisphere asymmetry in the incidence of and lateralization of symptoms in conversion disorders.
6. Sociocultural and epidemiological aspects of mental illness.

Role of Violence

The relationship of violence to conversion disorders was studied in a series of investigations at the Veterans Administration Hospital in Salem, Virginia and the Walter Reed Army Medical Center in Washington, D.C.[46–48] A majority, 70%, of patients, including men and women, attributed their symptoms to an injury, or placed the onset in a traumatic setting, even though the trauma may have been minor and occurred months or years previously. Reports included falls, wounds, blows, vehicle accidents, surgical operations, a dental novocaine injection, family quarrels, witnessing an act of violence, and, in one instance, a voodoo spell. Women were more apt to cite sexual violence, such as an attempted rape or seduction or a Lesbian solicitation. In contrast, control subjects with organic impairments comparable to the conversion symptom did not invoke trauma unless the disability had actually been caused by an injury. Similarly, none of a group of patients with anxiety states that served as another control attributed his illness to injury.

A content analysis of verbal language showed that conversion subjects also used more words of violence to describe their symptoms and experiences. Patients with hemisensory syndromes spoke of a side as "dead," and as feeling as if they had been "cut in half." Men who had been in vehicle accidents used more expressions such as, "smashed," "mashed," and "killed" than controls who had sustained comparable accidents and injuries. A soldier who developed a functional paralysis of his right arm after bayonet practice characterized the exercise as "kill or be killed." Violence was the metaphor through which the patient organized his experience, and his idea of what happened to him was, in terms of the response of his nervous system, as important as what actually happened. A decorated veteran of the Korean conflict, the sole survivor of an airplane crash in which 20 people had died, described the screams of the dying and the smell of

the flesh of burning bodies, even though he had been unconscious at the time.

The following case illustrates how the recall of traumatic events and the idiom of violence may serve as symbolic or metaphorical representations of current problems, and how the intensity of such recollections may vary with changes in the person's present circumstances. The case also indicates the association of a conversion disorder and features of a post-traumatic stress disorder.

Case Study 2: Forgetting Remembrance of Things Past

A 44-year-old dairy farmer was admitted to the Salem Virginia VA Hospital in 1963 with complaints of nervousness, blackouts, dizziness, headaches, and loss of feeling and weakness over the left side of his body. He stated initially that the left-sided symptoms had come on during World War II service in Italy after a shrapnel injury to his left sciatic nerve.

On examination, there were mild residuals of sciatic nerve involvement, along with marked weakness and sensory loss of a functional type over the entire left side of his body, reduced vision in the left eye, and diminished hearing in the left ear. When asked how his symptoms had begun, the patient gave a dramatic account of the death of his commanding officer, and the loss of most of the men in his company. He went on to tell how he had been ordered to target a church in which German soldiers were thought to be hiding. After the church had been demolished, it was found to have been filled with women and children. He had been continually troubled by recollections of the event and when he entered any church became disturbed by the thought of the massacre.

The patient improved over the course of hospitalization, and at follow-up a year later he reported that he had done well except for some irritability and nervousness. He no longer complained of the loss of feeling over his left side, and examination showed only a faint diminution of sensation. He now attributed his nervousness to overwork, business problems, and difficulties with a brother-in-law on whom he had depended. He thought that his left-sided symptoms had come on several years earlier after he had done some heavy lifting on the farm. When asked about his wartime experiences, he said he could remember little or nothing about them.

Comment: In one situation a conversion symptom may be associated with traumatic events; after the patient has recovered he may have an amnesia for the traumatic experience.

Denial

Patients denied concern over the emotional, social, and occupational problems that appeared connected with the conversion symptom. They might deny fear of combat, job dissatisfaction, and feelings of incompetence. Some tended to resent psychiatric investigation and statements by examiners that they did not have an organic condition. They also showed no appreciation of the consequences of the putative organic disease. The following cases indicate how the traditional *la belle indifference* may be regarded as a form of denial.

Case Study 3: Movements that Prevented A Move

A 41-year-old infantry platoon sergeant with 12 years of active duty was hospitalized at Walter Reed Army Medical Center in July 1991 because of bizarre involuntary movements that had come on in January after his unit had been notified that they had been ordered from Germany to the Persian Gulf. He also complained of numbness and weakness of his left side since a head injury in 1984. Neurological examination revealed a staggering, saltatory gait, and a left hemisensory syndrome with jerking of his left limbs. A work-up including magnetic resonance imaging (MRI) yielded no evidence of organic involvement. During a Sodium Amytal interview, the patient walked normally, but his symptoms soon recurred and he refused another session. He had a cheerful, unworried demeanor despite his objection to being on a psychiatric floor and his demand to be seen by an expert in Huntington's disease, a condition that had been diagnosed by a German civilian neurologist.

The soldier had grown up in the rural South and had less than a high school education. He gave a dramatic family history of poverty, violence, and serious illnesses. His father was described as having a bad temper that led him into frequent fights and, when enraged, he had fits in which he trembled all over. Mother did the whipping and was very religious. Siblings were said to have illnesses that included schizophrenia, a cerebral hemorrhage, and neuritis with difficulty in walking.

Comment: The denial was shown in several ways. The patient maintained a cheerful manner and lack of concern for both his own and his family's disabilities. The spectacular gait and bizarre involuntary movements may also be seen in terms of adaptation, as a tragi-comic caricature or parody of disease. While such extreme melodramatic behavior is uncommon, many patients appeared unruffled by their situation. Some may be unconcerned with the conversion manifestation itself but are tense, withdrawn, and even hostile.

Case Study 4: Denial by Bravado

A 27-year-old female U.S. Marine was admitted to the hospital 2 weeks after she had passed out on a run at boot camp. She complained of numbness of her left ankle and toes and received a negative work-up for reflex sympathetic dystrophy. She developed weakness in her legs and impaired walking and was diagnosed as Achilles tendonitis. Examination showed functional weakness of

both lower extremities and hyperesthesia with no evidence of spinal cord, root, or peripheral nerve disease. She had difficulty in standing and could only walk on crutches. Despite her condition, she was eager to return to duty saying in rather belligerent fashion that she was too tough to be laid up by a sprained ankle. She wanted to serve in the U.S. Marines to fight terrorists, then join the FBI [Federal Bureau of Investigation] to fight crime, and then use the GI bill to become a coroner.

Comment: The case illustrates how an obviously incapacitated conversion patient may insist on returning to duty, often with boasts of prowess and intent to wreak mayhem on the enemy.

Dissociation

Conversion disorders have dissociative aspects in that somatic and cognitive experiences may occur out of the sphere of conscious awareness. As in the two cases cited above, patients may regard the affected part of the body as outside and emotionally irrelevant to the self. The following excerpt illustrates an acute dissociative reaction in the form of a functional amnesia.

Case Study 5: A Fall From Battle

A 25-year-old U.S. Marine was evacuated from the fighting in Panama after a fall on his head. For a period of a week he did not know his name or anything of his past life. He spoke with a Latin accent that he had not had prior to his injury, and did not recognize his wife. There was no anterograde amnesia; he watched television and was able to remember what he had seen. He knew of Mohammed Ali and Babe Ruth because he had seen them on television since coming to the hospital. Neurological study found no evidence of brain damage and his memory suddenly returned.

Comment: More often the amnesia does not involve such a profound loss of the data of personal identity, and a patient may report no memory of an experience or limited span of time. Commonly, the person states that he will find himself in a certain place, and will have no recollection of going there. Functional amnesia may follow a fugue state, the essential feature of which is the assumption of a new identity without awareness of the previous identity. In the classical form the person is not aware of his memory loss, and the condition often involves travel away from his base.

Organicity

Estimates in the literature of central nervous system pathology in conversion disorders vary widely depending on symptomatology, type of medical facility, methods of investigation, and criteria of organicity. The highest incidence of 62.5% is reported by Whitlock[49] whose 56 patients were studied, in most instances retrospectively, on inpatient psychiatric services in England and Australia. The major categories of organicity were a concussive head injury during the preceding 6 months and a history of epilepsy. A similar study in Canada by Roy[50] yielded evidence of neural pathology in only 16% of cases. At the other extreme, is the report of about 1% of conversion disorders in neurological patients admitted over 3 decades to the National Hospital for Nervous Diseases, Queen Square, London.[51] Brandt[52] found an incidence of 9% among over 4,000 neurological patients admitted to a general hospital in Munich. Pain and dizziness were among the most common symptoms and this may account for the difference from the Queen Square findings. Weinstein[53] reported functional paralysis, sensory loss, and involuntary movements in 16 of 200 soldiers hospitalized for closed-head injuries with documented periods of unconsciousness followed by disorientation, amnesia, and confabulation. Conversion manifestations appeared after these disturbances of consciousness had cleared, at intervals up to 8 months.[46]

The author's ongoing study of 90 patients with conversion disorders admitted to the neurological and psychiatric services of the National Naval Medical Center and Walter Reed Army Medical Center (both in Washington, D.C.) has yielded evidence of neural pathology in 20 cases. The criteria are objective clinical signs of brain damage confirmed by laboratory findings, a head injury or anoxic episode with loss of consciousness within the previous 6 months, or a documented history of brain disease. Five patients had clear cut neurological conditions; two had multiple sclerosis, two had cerebral vascular involvement (one with collagen disease), and another patient had progressive supranuclear palsy with dementia. Eleven patients had had head injuries with loss of consciousness or anoxic episodes, that were momentary in most instances. Four of the 11 had computed tomography (CT), magnetic resonance imaging (MRI), or electroencephalogram (EEG) abnormalities. Two patients had had a bona fide seizure prior to developing psuedoseizures. One had a dural sinus thrombosis with a persisting abnormal MRI. A patient with pseudoseizures and a functional left hemisensory syndrome had an Arnold-Chiari malformation, and one soldier had a history of childhood hyperactivity/attention-deficit disorder.

These data may be interpreted in a number of ways. One is that organic neurological disease may

be misdiagnosed. Another is that there may be functional elaboration of deficits caused by the brain lesion. Third, brain injury may facilitate the dissociative process and lower the threshold for conversion disorders. On the other hand, there is no correlation between the severity of brain damage and the occurrence of conversion reactions. The high proportion of head injuries reported may be a reflection of the tendency of patients with conversion disorders to focus their problems on trauma. Head injuries or other brain disease including seizures in childhood may contribute to less education and lower socioeconomic status, both risk factors for conversion disorders.

Laterality

Almost all 19th and early 20th century neurologists believed that hysterical phenomena occurred predominantly on the left side of the body, and a number of modern studies[51,54,55] have confirmed an asymmetry. Handedness was shown not to be a factor.[55] Several explanations, some based on investigations of hemisphere specialization in neurological conditions, have been offered. One is that the right brain is specialized for the monitoring of somatic states and the mediation of negative emotional processes. A recent literature review[56] of the thalamic pain syndrome of Dejerine-Roussy showed a significant predominance of right thalamic lesions in cases with lateralized pain. In contrast, the incidence of the other components of the syndrome—hemiparesis, sensory impairment, ataxia, and choreoathetosis—did not differ significantly in the left and right groups.

Another approach draws on the analogies of hysterical hemisensorimotor syndromes with anosognosia and hemineglect, both of which occur mainly as a result of right brain lesions. In the various forms of anosognosia, the patient denies, caricatures, or appears indifferent to his deficits, and may even feel that the affected parts of the body do not belong to him. In hemineglect, he ignores stimuli and events on the impaired side of his body and in circumambient hemispace. Patients with hemineglect following strokes, brain traumas, or mass lesions may show a midline split to all sensory modalities, including vibration, and a disinclination to use the impaired extremities or look to the affected side even though such movements can be elicited in other contexts.[57–59]

One may speculate that patients with functional hemisensorimotor syndromes show the affective, subjective aspects of anosognosia and hemineglect. They may feel that the affected side of the body is dead, insensitive, or detached from the self. From the standpoint of diagnosis, however, such patients do not have tactile or visual extinction. Nor do they bisect a line or draw a clock or human figure in asymmetrical fashion, or show the eye shift to the unaffected side on visual confrontation characteristic of organic visual neglect.

Epidemiology

Major conversion disorders occur predominantly in the lower social classes, among the poor and less educated,[22,60–62] and in certain cultural groups. They are also common in societies in which violence is an important source of identity and mode of social relatedness.[47,63] The Salem, Virginia Veterans Administration Hospital was chosen for study because of its high rate of conversion disorders. Over a 4-year period in the 1960s, 25% to 30% of all patients admitted showed conversion manifestations at some time during hospitalization.

The patients were drawn mainly from the Appalachian counties of Virginia and West Virginia. The region was rural but nonfarming, and had an ethnically homogenous (mostly old, Anglo-Saxon, white, and Protestant) population. The decline of the extractive industries of mining and logging had led to economic depression. Educational facilities were limited, and the average school attainment at the time of the study was eighth grade.

Since the days of the Hatfields and the McCoys down through the mine union wars, Appalachia has had a tradition of violence. While the blood feuds have ended, a high rate of murder and nonnegligent homicide has persisted. Violence was a form of communication, occurring principally among relatives, friends, and acquaintances. Ownership of guns was universal and hunting and automobile racing the most popular sports. Violence in the form of physical beatings and the instillation of fears of ghosts and graveyards was a prominent instrument of child raising. The theme of violence pervaded religious beliefs—mainly of the Fundamentalist type. These emphasize divine punishment and forgiveness of sin, salvation and the next world, and saw in physical catastrophes evidence of the power of the Lord.

Attitudes toward health and illness were tied to the idea of a dangerous environment. As the economy dictated hazardous jobs, and safety standards were low, there was a high accident rate, and men worked until they were disabled or laid off. The manifestations of disability were a badge that

indicated that the person had worked and suffered, and many people grew up in a home with a disabled or crippled relative who was receiving compensation. These conditions, along with the military tradition of the region, produced a high rate of enlistment in the armed forces, particularly the combat branches, and the role of wounded or disabled veteran was a familiar, sanctioned, and rewarding one.

These features are present in some Latin American societies with their high homicide rates, male macho roles, and violent, bloody religious imagery. The so called *ataque* was not uncommon among Puerto Rican troops, usually in noncombat situations. It was characterized by the sudden onset of violent behavior, thrashing about, striking out and pseudoseizures, with homicidal and suicidal ideation, and, in some cases, belief of being affected by spirits of the dead. The attack lasted from a few minutes to one half hour and was followed by amnesia. It was brought on by feelings of rage, frustration, and disappointment, and usually cleared when the man was placed in isolation.[64] Compton and Jones[65] showed that the syndrome (sometimes called the Puerto Rican Syndrome) occurred in all Hispanic military populations and appeared to be culturally determined.

A major reason why conversion disorders have occurred more commonly in women is that, historically, except in wars, women have been subjected to more physical and sexual violence—much of it institutionalized—than men. Currently in the armed forces conversion disorders occur with equal frequency in men and women.

DIFFERENTIAL DIAGNOSIS

The diagnosis of a conversion disorder depends primarily on the neurological examination in which the findings symbolize some traumatic experience or conception by the patient of a loss of function, but do not conform to a neuroanatomical or neurophysiological pattern. The existence of an emotional conflict may not be helpful as anyone in a stressful situation may have problems. Similarly, determination of secondary gain is difficult to evaluate as soldiers with a variety of ailments may be seen as deriving some benefit from them.

Motor Disorders

Loss of motor power appears as weakness or paralysis of single limbs, paraplegia or paraparesis, hemiparesis or hemiplegia. Quadriplegia as a conversion disorder is almost unknown. While the patient cannot move a limb voluntarily, or fails to exert sustained power on effort—so-called give-away weakness—there are no postures indicative of weakness. In the supine position, the leg on the putatively hemiplegic side is not more externally rotated nor is the foot more dropped than its fellow, and when the upper limb is extended in pronation, the thumb does not droop. There is likely to be a Hoover sign in hemiplegia. When the supine putatively hemiparetic patient is asked to raise a leg alternatively or sit up, he does not press down harder with the heel of the good leg, as one would expect if the weakness were of organic origin. There is not the motor gradient characteristic of a cerebral lesion in which the greatest weakness is in the most distal muscles. In a hysterical hemiplegia the facial and tongue muscles are spared. Also, a patient with a hemiplegia may exhibit diminished power in turning his head to that side even though the action is performed by the contralateral sternomastoid muscle. He is apt to drag the leg or walk with a limp rather than with the circumduction of an organic hemiparesis. In hysterical monoplegia all movements about a joint are equally affected whereas in peripheral nerve or radicular lesions there is a segmental distribution.

Disorders of Stance, Gait, and Balance

The classical astasia-abasia refers to the person's inability to stand (astasia) or walk (abasia) even though other actions of the legs can be performed. In the Romberg position, there is an increasing amplitude of sway after a latency of a few seconds, and the patient avoids falling by grasping the examiner or staggering across the room to gain support from a wall. In walking there are exaggerated efforts to maintain balance by using the arms as if the patient were on a tightrope, or by flexing hips and knees to gain a lower center of gravity. There may be a fluctuation in performance, and the patient may walk as well in tandem or on his toes as in more conventional forms of locomotion. Gait may be very slow and hesitant with short steps and apparent sticking of the feet to the ground. Unlike the situation in Parkinson's disease, the inhibition is not overcome after the first few steps. Sudden buckling of the knees may occur, usually but not

always, without falling. Other conversion manifestations (sensorimotor, visual, oculomotor, speech, or pseudoseizures) may be associated. Chorea and dystonia are the neurological conditions most likely to be misdiagnosed. Also disturbances of gait and balance can be caused by drugs, anticonvulsants, antidepressants, alcohol, sedatives, and tranquilizers.

Vertigo, the sensation of the apparent movement of one's body or of an object in one's line of vision, may accompany astasia-abasia, but as a presenting symptom it is only rarely of hysterical origin. It is much more common in anxiety, panic and phobic states, and depression. Psychogenic vertigo is differentiated from disease of the vestibular system by the absence of nausea and vomiting and of rotational vertigo with direction-specific falling. If a complaint is of a rotational component, the absence of concurrent spontaneous nystagmus under Frenzel's glasses, which suppress nystagmus by fixation, suggests a functional etiology.[52,66]

Involuntary Movements

Tremor and myoclonus are the most common of the involuntary movements of psychological origin. Tremor consists of oscillatory movements produced by contractions of reciprocally innervated antagonistic muscles. Myoclonus is a quick involuntary jerk. These disorders usually have an abrupt onset following a head or back injury, a car accident, a surgical procedure, or some emotional upset. Psychogenic tremor generally combines resting, postural, and kinetic components, and varies in amplitude, frequency, and time of appearance. Both tremor and myoclonus may be relieved by placebos, reduced when the patient is distracted, increased by attention, and associated with other conversion manifestations such as sensory loss and giveaway weakness in the affected limbs, speech and gait disorders.[67,68]

Camptocormia is a postural disorder in which a soldier presents with severe forward flexion of the spine, often along with flexion at the knees and dangling of the arms. The position persists in walking but disappears when the man lies down. He complains of pain that he attributes to a back injury, and there is often a family history of back disability. A herniated disc or spinal stenosis is occasionally found but these are not causes of the deformity[69,70] although they determine its site.

Dystonia was formerly thought to be of psychological origin but studies in recent decades have established it as a neurological entity. It is a syndrome dominated by muscle contractions frequently causing twisting and repetitive movements, or abnormal postures that may be sustained or intermittent.[71] It can be focal or generalized and includes torticollis, involuntary movements of the thumb and limbs, orofacial and mandibular dystonia, blepharospasm, and dysphonia. Focal dystonia also includes writer's and piano and violin player's cramp and other specific task or instrument conditions. Electromyography reveals that reciprocal muscle inhibition is impaired so that there is cocontraction of agonists and antagonists.

The clinical picture may be bizarre—in dystonia involving the legs the patient may be able to walk forward but not backward. About 9% of cases are preceded by trauma and remissions occur in 12% of cases of torticollis.[72] However, dystonic movements and postures of psychogenic origin are rare.[73] In such cases the dystonic manifestations are apt to be associated with peculiarities of gait and functional types of sensory and motor loss. The following case excerpt illustrates some of the diagnostic pitfalls that may be encountered.

Case Study 6: The Wry Neck Recidivist

The patient was a 45-year-old field grade officer who was referred to a base section hospital in North Africa with a diagnosis of hysterical torticollis. The involuntary turning movements of his head to the left had come on while he was awaiting a court-martial for alleged black market dealings. The movements were interpreted as symbolic of his unconscious wish to turn away from the problems. Subsequent investigation, however, established a neurological diagnosis of torsion dystonia.

Comment: Stressful events may coincide with the onset of an organic neurological condition.

Sensory Disorders

Loss of sensation in conversion reactions involves a diminution or absence of feeling over one side of the body or in one or more limbs resulting in glove and gauntlet, and sock and stocking distributions. In hemisensory syndromes all or several modalities are involved without the dissociation usually found in cerebral lesions in which stereognosis, 2-point discrimination, graphesthesia, and position sense are more impaired than pain, temperature, touch, and vibration. During testing for astereognosis, the patient may manipulate the test object skillfully in his fingers indicating intact proprioception but still fail to identify it. There is commonly a midline demarcation in which the patient feels all stimuli less intensely on one complete half of the body, perceiving the tuning fork differently on either side

of the sternum and forehead, even though vibration is transmitted through the bone. A midline split on sensory examination is not necessarily present even though patients complain of a loss of feeling over the entire half of the body. The special senses are also involved: on being tested the patient reports poorer vision in one eye, reduced hearing in the corresponding ear, and even less smell in one nostril and less taste on one side of the tongue.

The phenomenon of extinction elicited by the method of double simultaneous stimulation is useful in distinguishing a hemisensory deficit of hysterical origin from one caused by structural brain damage. Patients with pathology in one hemisphere may have normal or slightly reduced responses to touch and pinprick with a single stimulus to the side opposite the brain lesion, but when bilateral simultaneous stimuli are applied sensation is extinguished or further reduced on the side contralateral to the lesion. The responses of patients with a conversion disorder, however, are not affected by the method of testing.

In conversion disorders involving single limbs there is a loss of a sensory gradient. If impaired sensation in the lower extremities is caused by a spinal cord lesion, then vibratory sensation is most impaired in the toes and less affected over the more proximal areas. In conversion reactions, on the other hand, the vibratory sensation may be not only absent in the toes but over the ankles and knees. The examiner should avoid suggesting to the patient that his sensation is impaired; hemisensory syndromes can be created iatrogenically.

Visual Disorders

In no area of neurological examination is the physician–patient interaction more likely to affect results than in the plotting of the visual fields. Fatigue, inattention, or suggestibility on the part of the patient and overzealousness and impatience of an examiner can produce abnormal visual fields even in people who have no visual complaints, and the findings may differ on successive examinations. Functional visual field loss takes the forms of constricted or tubular fields in which the size of the field does not vary with distance of the target, spiral fields that progressively diminish during testing so that only central fields remain, and focal field defects that do not follow an anatomical or physiological pattern. Tunnel fields may occasionally be found in patients with frontal lobe tumors.

Functional blindness can be detected by normal pupillary light reactions (impaired in blindness of organic neurological origin except in cortical blindness due to bilateral occipital lobe lesions), by producing a blink response to visual threat, by eliciting eye movements with an optokinetic tape or drum, and by moving a large mirror to and fro and up and down in front of the patient while observing eye movements corresponding to the movement of the mirror.[74] The red glass test is particularly useful in monocular blindness. The patient is asked to read a line of alternating black and red letters with a red glass placed over the good eye. Any reading of the red letters must accordingly be done by the supposedly bad eye. Patients with functional reductions of visual acuity can be shown to have normal vision by retesting, encouragement, or subterfuges designed to identify normal acuity.[75]

Hearing Loss

Functional hearing loss is indicated when the behavioral response is inconsistent with auditory findings on examination. Psychogenic deafness is initially suggested if the patient speaks in a loud voice and refuses to communicate except in writing. Eye blink in response to a loud noise, or awakening from sleep after a loud sound indicates that hearing is present. More sophisticated procedures include delayed auditory feedback which normally disrupts performance on reading aloud. In unilateral hearing loss a tuning fork placed over the mastoid on the affected side should produce hearing, via the good ear through bone conduction, so the patient's report that he hears nothing indicates psychogenicity. The Stenger test makes use of the observation in normal persons that if identical signals differing in intensity by more than 20 decibels are presented to each ear, the sound appears to come from the ear in which the intensity was greater. If a high-intensity signal is put into the supposedly impaired ear at the same time that a low-intensity stimulus is delivered to the good ear, a failure of the good ear to hear indicates that there is auditory function in the involved ear.[76]

Speech Disorders

Stuttering is the most common hysterical speech disorder. It frequently occurs after trauma, and may be preceded by a period of mutism. It contrasts with conventional stuttering which begins in early childhood and starts only rarely in adults. Conventional stuttering is variable, occurs in different situations, with different words, typically involves the initial sound of a word, and does not occur in singing or more automatic speech like greeting and

counting. Conventional stutterers adapt with avoidant measures such as the use of a substitute word when they anticipate difficulty. Conversion subjects are rigid and unvarying, stuttering in all situations, and there may be associated jaw, face, tongue, and vocal cord tremors. Other functional disturbances include slow, labored, staccato, and syllabic deliveries.

Pseudoseizures

The differentiation of pseudoseizures (also known as psychogenic seizures) from bona fide epileptic fits depends on a number of criteria, no one of which is sufficient for an unequivocal diagnosis.[77] Moreover, pseudoseizures may coexist with true seizures (Table 15-1).

TABLE 15-1

CRITERIA FOR DIAGNOSIS OF EPILEPTIC AND PSYCHOGENIC SEIZURES

Characteristics	Generalized Tonic Clonic Seizures	Complex Partial Seizures	Psychogenic Seizures
Onset	Usually paroxysmal; may be preceded by seizures of different muscles or auras	Usually paroxysmal; may be preceded by aura of only few seconds	Often gradual; prolonged, nonspecific warning may occur
Postictal confusion	Prominent	Almost always present	Often conspicuously absent; patient may be normal immediately after attack
Recollection of events	None	Usually scant and most often none	Sometimes detailed
Suggestibility	None	Rare	Occasionally
Violent behavior	None	Rare; virtually always in response to restraint and not highly directed	Rare; but may be highly directed
Weeping*	None	Very rare	Common
Comparison with known seizure types	Relatively little variation in events	Wide range of events, but most common are well described	Extremely wide range of events with bizarre and unusual behavior
EEG during seizure	Abnormal and changed from preictal	Frequently abnormal and changed from preictal	Usually normal and unchanged from preictal
EEG immediately after seizures	Almost always abnormal and changed from preictal	Frequently abnormal and changed from preictal	Usually normal and unchanged from preictal
Abnormal neurological signs during seizure	May be present (example: Todd's paralysis)	May be present	None
Relation of attacks to medical regimen	Prominent, especially in severely affected patients	Usually related	Usually unrelated but anticonvulsive medication may increase frequency of seizures
Nocturnal occurrence	Common	May occur	Rare

*Source: Bergen D, Ristanovic R. Weeping as a common element of pseudoseizures. *Arch Neurol*. 1993;50:1059–1060.
Adapted from Desai BT, Porter RJ, Penry JK. Psychogenic Seizures: A study of 42 attacks in six patients, with intensive monitoring. *Arch Neurol.* 1982;39:207-208.

More recent studies have shown that frontal lobe seizures from mesial and orbital foci in which vocal profanities and obscenities, rocking, and pelvic thrusting are apt to occur and seizures arising from the supplementary motor area with thrashing movements and tonic posturing are particularly apt to be mistaken for psychogenic seizures. They are distinguished from the latter principally by short duration (usually less than a minute), stereotypy and nocturnal occurrence, as well as EEG and MRI findings.[78–80]

Amnesia

Amnesia is a loss of memory for periods of time and personal experiences, rather than inability to remember facts and procedures. Amnesia may occur on an organic or functional basis, and usually follows some interruption of consciousness or emotional trauma. Anterograde amnesia (AA) refers to the period of time following the acute event over which the patient is unable to retain new information, and for which he later has no memory. Retrograde amnesia (RA) refers to the period prior to the acute episode for which the person reports no memory. Following loss of consciousness from a concussion or other brain injury there is both an AA and an RA, even though the RA may be very brief, and the patient may remember everything up to a few seconds before impact. One does not remember the blow or other agent causing loss of consciousness. If, however, the patient recalls and describes the crash of the car or the bursting of a shell, the inference is that he did not lose consciousness, and even though he may state that he does not then remember anything until he found himself in a clearing station or hospital, unable to walk or talk, it is likely that the amnesia is not directly caused by brain injury.

The profound amnesias of dissociated and fugue states such as that described in Case Study 5 are differentiated from the amnesias of brain injury by the loss of data of personal identity and the exclusively retrograde character of the memory loss. Even when the RA following brain damage is extensive, the person knows his name, address, occupation, religion, and other autobiographical information. He may not remember his actual marriage ceremony, but he knows he is married and recognizes his wife. He may not remember actually enlisting, but he knows he is in the U.S. Army. Also most organic amnesias show a temporal gradient in that more remote events are recalled better.

Amnesia resulting from alcoholic intoxication usually covers only the period of intoxication and prolongation beyond that period suggests functional elaboration. Transient global amnesia (TGA) should be considered in cases of sudden onset in persons over the age of 40. TGA involves the sudden occurrence of a marked anterograde and variable retrograde amnesia, typically accompanied by bewilderment and agitation, with the patient repeatedly asking the same questions. Data of personal identity are retained, and immediate recall is preserved. The condition clears within hours. The cause is unknown, but a migrainous etiology is likely.[81]

Simulated Amnesia

Patients may simulate, exaggerate, or dramatize memory loss. Useful but not infallible aids in distinguishing such states are:

1. Absence of a gradient of difficulty in that subject may do as poorly on a difficult task as an easier one.
2. Responses may be very slow.
3. Recognition is not better than recall.
4. Immediate recall, which is intact in most organic conditions, is involved.
5. Performance is not improved with cues and clues.
6. Elements of a Ganser syndrome may be present.

Ganser Syndrome or Pseudodementia

In 1898, Sigbert J. Ganser, a German psychiatrist, described four prisoners with episodes of clouding of consciousness, disorientation, hysterical conversion symptoms, hallucinations, a recent history of head injury or typhus, and *vorbeireden*.[82] The last feature consists of "talking past the point," in which the patient gives approximate answers such as stating that 2 plus 2 are 5, and calling a blue object pink. The behavior was of short duration and subjects were later amnesic. The syndrome has occurred not only in prisoners but in persons awaiting trial, in military personnel facing disciplinary action or being otherwise embittered with military life. The complete syndrome is only rarely present but fragments, particularly *vorbeireden*, are common. Patients state that the capital of France is Marseilles or may draw a clock with the numbers reversed. Responses may be very

slow. Violence and suicidal gestures may occur. Malingering is often suspected, as patients seem to be simulating insanity, or exaggerating a psychotic experience. In recent years, cases with Ganser features have been reported following not only head injury, but also strokes, brain tumors, and acute psychosis, and have occurred in women as well as men.[83,84]

TREATMENT

In the treatment of conversion disorders, the major emphasis should be placed on removal of symptoms. If these are not cleared, they take on a life of their own, and persist even after the underlying emotional problems are no longer relevant. These emotional problems are rarely "deep" in the sense that they represent repressed unconscious conflicts, but are usually situational. In general, the most effective treatments are those that emphasize affect and relatedness rather than insight. These involve the induction of a state of mind or milieu of brain function in which affect is released and the person can reformulate stressful experiences in symbols and imagery. This may come about in the context of a rapport with the therapist, via the product of trance state by hypnosis, and through the alteration of brain function provided by such drugs as Sodium Amytal. The following three cases are illustrative.

Case Study 7: Abreaction through Confession

A 20-year-old combat infantry private first class (PFC) was seen in April 1969 at Phuoc Vinh, Vietnam by Captain [later Major General] James H. Rumbaugh because of a complete paralysis and loss of feeling in his left upper extremity. He reported that he had tripped over a tree trunk and landed on his left shoulder. Because of soreness and some deviation of his head to the left he was taken to a hospital, put in head traction, and given a soft collar. On the night following his discharge his unit was mortared. He rolled out of his bunk, fell on his arm, and "tore it up so bad" that he had to go back to the hospital. Neurological examination now showed a functional paralysis of the entire left arm and a sensory loss for all modalities which included the shoulder area. There were two circumscribed burns on the left forearm where the soldier had not felt a lit cigarette. Medical history disclosed that after lifting paper at a factory, a year prior to enlistment, he had "messed up" his back and had been unable to move his legs or walk for several weeks.

The patient stated that he had been in service for 9 months and had gone to jump school at Fort Benning. When asked why he had gone he said that it was to do something outstanding for the glory of it. He had been born in rural Tennessee and had graduated from high school in Michigan where his father had become an automobile worker. He had gotten along well with his parents, but described his father as having a high temper. He and his brothers would get beaten with a switch or a strap, particularly when his father had been drinking. He was devoted to his mother whom he depicted as suffering from "heart spells" and as very religious.

A few hours after the initial interview, the soldier approached Captain Rumbaugh to say that there was something on his conscience. With considerable emotion he confessed that the jump wings he was wearing were not his own, but had been given to him by a boy whom he had met on the plane. He was told he could still be an outstanding soldier, and Captain Rumbaugh assured him that very soon feeling and then motor function would return. The next day he had pins and needles sensations in his fingers, followed by twitches in his thumb. At the end of a 2-week period he had completely recovered. Follow-up from brigade surgeons indicated a successful return to duty.

Comment: In this case the development of the conversion symptom may have been facilitated by the hospitalization and the orthopedic procedures.

Hypnosis and abreaction through the intravenous administration of barbiturates are indicated when the patient has not responded to suggestion and encouragement. Hypnosis is indicated especially in subjects with a high-induction profile (HIP).[85] The HIP is an indicator of hypnotizability consisting of a biological component, the ability to maintain upward gaze during slow lid closure, and a psychophysiological one, the capacity for arm levitation. According to Spiegel and Spiegel,[85] the highly hypnotizable individual has a reliance on feeling rather than reasoning, a tendency to live in the present, and a capacity for intense focal concentration. These features are enhanced in combat.

Case Study 8: Revisualization of Trauma

A medic, seen by Captain Herbert Spiegel during World War II, was returned from a battlefield in Tunisia with inability to use his legs, despite the absence of organic findings. He and his unit had come under heavy fire, and, after the sergeant ordered retreat, the soldier heard the cry of a friend for help, and saw the foot of someone who might have been the friend lying behind a rock. However, he obeyed the order and retreated and his

friend never returned. He was overwhelmed with remorse at not having tried to rescue him. The man was highly hypnotizable and was able to readily regress to the past. He was instructed to revisualize the scene of leaving the battlefield with one modification, that the foot he had seen was facing downward, with the implication that the man was already dead. The soldier came out of the trance with an exhilarating sense of "discovery" that his friend could not have been saved. Within a few days he regained his ability to walk and returned to active duty.[85(p140)]

Comment: In combat areas where alertness and mobility are important, hypnosis is in some ways preferable to techniques involving barbiturates. Hypnosis does not require venipuncture or sterile procedures and precautions against respiratory and circulatory depression, and is not followed by drowsiness and ataxia. An occasional subject becomes agitated and violent with barbiturate administration, while in hypnosis the degree of abreaction can be controlled. Also, posthypnotic suggestions may be made for the handling of anticipated symptoms.[86,87]

The Amytal interview is indicated in situations in which the patient is not communicative and related, especially in cases of stupor, muteness, and deafness. It is also preferable to hypnosis when there is lack of motivation, and where there is an inability or unwillingness to focus attention.

Case Study 9: Abreaction in Dramatic Metaphor

An 18-year-old radio operator with 6 months service was evacuated to Walter Reed Army Medical Center from Germany because of difficulty in articulation. He spoke in garbled fashion clicking his tongue against the roof of his mouth. The symptom had come on the day after receiving a painful novocaine dental injection and had gotten worse over the next 2 months. The soldier was from a rural Southern area and had had 4 years of high school.

Under Sodium Amytal he became very drowsy but recovered to speak understandably. He told of his dissatisfaction with his job, the shock of seeing black men with white women. He described how upset he was when he found that the dentist was a black woman. He went on to say how worried he was about his mother, who had no one to take care of her. She had told him that she, too, had a burning in her mouth after dental work. He was vague about his father who, he said, had been killed by the Mafia. He, himself, had almost been killed in an accident but had been saved by a miracle. The patient spoke normally but the following day had relapsed halfway. Following a leave home, he talked normally. A psychiatric evaluation noted dependent and avoidant personality traits and he was not returned to overseas duty.

Comment: The case illustrates how, under the conditions of brain function supplied by a barbiturate, the soldier could restructure the problems of job inadequacy and homesickness in metaphors of race, violence, and filial devotion.

The Amytal procedure is helpful in the detection of volitional elements and malingering. Such patients may become excessively drowsy even before there is a sufficient amount of the drug to have any physiological effect. The subject may keep his eyes tightly closed when the examiner is eliciting eye movements and may not answer questions or may respond in inaudible fashion.

The Amytal Test[88,89] also serves in the diagnosis of brain disease. Prior to injection the patient is asked a series of questions dealing with orientation and awareness of impairment, and answers are recorded. (If the patient is already disoriented this is indicative of brain dysfunction and the procedure is not indicated.) The drug is then introduced intravenously at a rate of 50 mg/min until errors in counting backward, slurring of speech, mood change (usually euphoria), and nystagmus are observed. The questions are then repeated. One or more persisting errors constitute a positive result indicative of organic brain dysfunction. Patients without brain damage remain oriented and aware of impairment throughout with only occasional transient self-corrected errors.

Case Study 10: Misdiagnosis Revealed by the Amytal Test

A 44-year-old naval petty officer jet mechanic with 19 years active duty had a 10-year history of reduced color vision that came on while he was on sea duty off Vietnam. It became difficult for him to work with color-coded wires, and subsequently he became unable to move his eyes. Most recently he had complained of difficulty in remembering names and telephone numbers. Routine mental status was within normal limits and on neuro-ophthalmological examination he could not move his eyes laterally or vertically on voluntary effort, but some movement was noted when he was distracted. Optokinetic nystagmus was obtained and the vestibular ocular reflex was normal. A diagnosis of conversion disorder was made.

He was given the Amytal Test at the National Naval Medical Center in Bethesda. He answered the preinjection questions accurately, and these were repeated after the administration of 300 mg of the drug. He became disoriented for place, stated repeatedly that he was in Pensacola, a former duty station, and was also disoriented for month and year. Subsequent MRI showed evidence of bilateral occipital lobe lesions, and he went on to develop a frank dementia.

Comment: This case illustrates the value of the Amytal Test in detecting neural pathology in cases in which routine examination and laboratory tests have been normal.

When soldiers do not respond to therapy there arise questions of associated brain damage, depres-

sion, or mechanisms beyond the original dissociative process that are not entirely out of conscious control. It is uncommon for a patient to manufacture symptoms out of whole cloth, but the idea of incapacity has been implanted by the initial injury, real or fancied, and after separation from his or her group, the conversion symptoms symbolize and maintain a new identity as a disabled soldier. This role is reinforced by each neurological or orthopedic examination, and by the prospect of secondary gain.

After a conversion symptom has been present for weeks and the soldier has been evacuated, it is unlikely that he will return to combat. The emphasis should now be on the avoidance of procedures that support the idea of physical disease or increase secondary gain. Hospital privileges should be made dependent on clinical improvement, and the prospect of another assignment or a favorable discharge held out. Certain hysterical conditions such as camptocormia are notoriously resistant to treatment and such patients should generally be promptly separated from the service.

SUMMARY AND CONCLUSION

Conversion disorders have historically been associated with violence. They have been attributed to the malign influence of devils and witches, to divine wrath, to the sexual abuse and forcible subjugation of women, to industrial trauma, and to shell shock in war.

Patients with conversion reactions describe their symptoms in idioms of violence, ascribe them to an injury, and depict their onset in a violent setting, even though the traumas may have been relatively minor and removed in time. The conversion symptom is a symbolic representation of a felt disability or a traumatic experience. The language, verbal and gestural, imparts meaning and a *feeling* of reality not only by reason of the trauma itself, but because violence and the anticipation of violence have been such important elements in patterns of social relatedness. There is predisposition not in the sense of mental illness or personality disorder—although these are often deduced after the fact—but because of lower class status, limited education, cultural tradition, family violence or physical disability, previous conversion episodes, and, more immediately, a recent wound or injury requiring hospitalization.

Conversion disorders are not disease entities but signs and symptoms. Their character and incidence have varied over the centuries with the forms of trauma, cultural change, and the degree to which the behavior is reinforced by society. One no longer sees the stigmata of the Crucifixion, or the *attitudes passionelles* of Charcot's day. Conversion hysteria was the hallmark of World War I, exhaustion featured World War II, and post-traumatic stress disorder came out of Vietnam. Conversion reactions occur in the course of a number of conditions: post-traumatic stress disorder (PTSD), adjustment disorders, depression, multiple personality, Axis II disorders, and brain damage. The roles of brain dysfunction and hemisphere specialization, and the physiological mechanisms of dissociation are as yet not well understood; but, depending on the circumstances under which people are exposed to threats of death and mutilation and loss of personal integrity, then dissociative processes in the form of conversion disorders, PTSD, or some clinical syndrome yet to be described will appear.

REFERENCES

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM III)*, Washington, DC: APA; 1980.

2. Barnes JK. *The Medical and Surgical History of the War of the Rebellion.* Prepared under the direction of Surgeon General Joseph K. Barnes, United States Army. Washington, DC: GPO, 1870–1888.

3. Porter IG. Case report. *Am J Med Sci.* 1864;134–137.

4. Mitchell SW, Morehouse GD, Keen WW. Reflex Paralysis, Article 6. Washington, DC: The Office of the Surgeon General; 1864.

5. Briquet P. *Traité de l'Hystérie*. Paris, France: JB Ballière et fils; 1859.

6. Charcot JM. Discussed in: Ellenberger HF. *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*. New York: Basic Books; 1970.

7. Janet P. Discussed in: Ellenberger HF. *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*. New York: Basic Books; 1970.

8. Reynolds JR. Remarks on paralysis, and other disorders of motion and sensation. *Br Med J* [now *Br Med J (Clin Res)*]. 1869;6:483–485.

9. Breuer J, Freud S. Studies on hysteria. In: Strachey J, Freud A, eds; Strachey J, trans-ed. *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Vol 2. London, England: Hogarth; 1953.

10. Bailey P, Haber R. Occurrence of neuropsychiatric diseases in the Army. In: Bailey P, Williams FE, Komora PO, eds. *Neuropsychiatry*. Vol 10. In: *The Medical Department of the United States Army in the World War*. Washington, DC: Office of The Surgeon General, US Army; 1929: 154.

11. Mott SW. War psycho-neurosis. *Lancet*. 1918;Jan 26:127–129, Feb 2:169–172.

12. Wolfsohn JM. The predisposing factors of war psycho-neuroses. *Lancet*. 1918;Feb 2:177–180.

13. Farrar CB. War and neurosis. *Am J Insanity* [now *Am J Psychiatry*]. 1917;73(12).

14. Eder MD. *War Shock*. London, England: Heinemann; 1917.

15. Nonne M. Hypnotism in war hysteria. (Berlin Letter. Dec 14, 1915) *JAMA*. 1916;66:440–441.

16. Hurst AF. Hysteria. *Lancet*. 1919;Nov 1:771–779.

17. Myers CS. *Shell Shock in France 1914–1918*. Cambridge, England: Cambridge University Press; 1940.

18. Roussy G, Lhermitte J. *The Psychoneuroses of War*. Paris, France: Masson et cie; 1918.

19. Ross TA. The prevention of relapse of hysterical manifestations. *Lancet*. 1918;Oct 19:516–517.

20. Hurst AF, Peters EA. The pathology, diagnosis and treatment of absolute hysterical deafness in soldiers. *Lancet*. 1917;Oct 6:517–519.

21. Chodoff P. A re-examination of some aspects of conversion hysteria. *Psychiatry*. 1954;17:75–81.

22. Ziegler FS, Imboden JB, Meyer E. Contemporary conversion reactions. *Am J Psychiatry*. 1959;116:901–910.

23. Noble D. Hysterical manifestations in schizophrenic illness. *Psychiatry*. 1951;14:153–160.

24. Weinstein EA. The Fifth Army Neuropsychiatric Center—"601st". In: Glass AJ, ed. *Overseas Theaters*. Vol 2. In: *Neuropsychiatry in World War II*. Washington, DC: Office of The Surgeon General, US Army; 1973: 127–141.

25. Wagner PS. Psychiatric activities during the Normandy Offensive: June 20–August 20, 1944. *Psychiatry*. 1946;9:341–364.

26. Swank R. Combat exhaustion. *J Nerv Ment Dis*. 1949;109:475–508.

27. Fisher ED. Psychoneurosis in the armed forces. *Bull US Army Med Dept*. 1947;7:939–947.

28. Torrie A. Psychosomatic casualties in the Middle East. *Lancet*. 1944;Jan 29:139–143.

29. Schneider RJ. Stress breakdown in the Wehrmacht: Implications for today's Army. In: Belenky G, ed. *Contemporary Studies in Combat Psychiatry*. New York: Greenwood Press; 1987: 87–101.

30. Anderson RC. Neuropsychiatric problems of the flier. In: Glass AJ, ed. *Overseas Theaters*. Vol 2. In: *Neuropsychiatry in World War II*. Washington, DC: Office of The Surgeon General, US Army; 1973: 881–891.

31. Ironside R, Batchelor IRC. The ocular manifestations of hysteria in relation to flying. *Br J Ophthalmol.* 1945;29:88–98.

32. Kardiner A, Spiegel H. *War Stress and Neurotic Illness*. New York: Paul B. Hoeber; 1947.

33. Horsley JS. *Narco-analysis*. London, England: Oxford; 1943.

34. Grinker RR, Spiegel JP. *Men Under Stress.* Philadelphia, Pa: Blakiston; 1945.

35. Sargant W, Slater E. Amnesic soldiers in war. *Proc R Soc Med* [now *J R Soc Med*].1941;35:757–760.

36. Parfitt DN, Gale CMC. Psychogenic amnesia: The refusal to remember. *J Ment Sci*. 1944;XC:33–41.

37. Boshes B, Roberts LP, Tureen LL. Base section psychiatry. In: Glass AJ, ed. *Overseas Theaters*. Vol 2. In: *Neuropsychiatry in World War II*. Washington, DC: Office of The Surgeon General, US Army; 1973: 148–185.

38. Eitinger L. Denial in concentration camps: Some personal observations on the positive and negative aspects of denial in extreme life situations. In: Breznitz S, ed. *The Denial of Stress*. New York: International Universities Press; 1983: 199–212.

39. Kral VA. Psychiatric observations under severe chronic stress. *Am J Psychiatry*. 1951;108:185–192.

40. Eitinger L. Pathology of the concentration camp syndrome. *Arch Gen Psychiatry.* 1961;5:371–379.

41. Jones FD. Experiences of a division psychiatrist in Viet Nam. *Milit Med.* 1967;1:1003–1008.

42. Carden NL, Schramel DJ. Observations of conversion reactions seen in troops involved in the Viet Nam Conflict. *Am J Psychiatry*. 1966;123:21–31.

43. Personal Communication. Statistical data provided by US Patient Administration Systems and Biostatistics Activity, Department of the Army, 1991.

44. Palinkas LA, Coben P. Psychiatric disorder among United States Marines wounded in action in Viet Nam. *J Nerv Ment Dis*. 1987;175(5):291–300.

45. Putnam FW. The scientific investigation of multiple personality disorder. In: Quen JM, ed. *Split Minds Split Brains: Historical and Current Perspectives*. New York: New York University Press; 1986: 109–125.

46. Weinstein EA, Lyerly OG. Conversion hysteria following brain injury. *Arch Neurol.* 1966;15:545–548.

47. Weinstein EA, Eck RA, Lyerly OG. Conversion hysteria in Appalachia. *Psychiatry*. 1969;32: 334–341.

48. Weinstein EA, Lyerly OG, Rumbaugh JH. Conversion reactions in military personnel. Read at Seminar of Department of Military Psychiatry. Walter Reed Army Institute of Research. 25 March 1989.

49. Whitlock FA. The aetiology of hysteria. *Acta Psychiatr Scand*. 1967;43:144–162.

50. Roy A. Hysteria: A case note study. *Can J Psychiatry*. 1979;24:157–161.

51. Trimble MR. *Neuropsychiatry*. New York: John Wiley; 1981.

52. Brandt T. *Vertigo: Its Multisensory Syndromes*. London, England: Springer Verlag; 1991.

53. Weinstein EA. Conversion hysteria after brain injury. *Trans Am Neurol Assoc.* 1966;91:361–362.

54. Galin D, Diamond R, Braff D. Lateralization of conversion symptoms: More frequent on the left. *Am J Psychiatry*. 1977;134(5):578–580.

55. Stern DB. Handedness and the lateral distribution of conversion reactions. *J Nerv Ment Dis*. 1977;164(2):122–128.

56. Saver JL. Right diencephalic lesions predominate in thalamic pain. *Neurology*. 1992;42(Suppl. 3):162.

57. Weinstein EA, Kahn RL. *Denial of Illness: Symbolic and Physiological Aspects*. Springfield, Ill: Charles C Thomas; 1955.

58. Weinstein EA, Kahn RL, Slote WH. Withdrawal, inattention and pain asymbolia. *Arch Neurol Psychiatr*. 1955;74:235–248.

59. Weinstein EA, Kahn RL, Sugarman LA. Ludic behavior in patients with brain disease. *J Hillside Hosp*. 1954;3:98–106.

60. Ljungberg L. Hysteria: A clinical prognostic and genetic study. *Acta Psychiatr Scand*. 1957;Supplement 112.

61. Guze SB, Woodruff RA, Clayton PS. A study of conversion symptoms in psychiatric outpatients. *Am J Psychiatr*. 1971;128:643–646.

62. Steffanson JA, Messina JA, Meyerowitz S. Hysterical neurosis, conversion type: Clinical and epidemiological considerations. *Acta Psychiatr Scand*. 1976;53:119–138.

63. Wiesel C, Arny M. Psychiatric study of coal miners in eastern Kentucky area. *Am J Psychiatry*. 1952;108(8):617–624.

64. Kepecs SG. Psychiatric disorders in Puerto Rican troops. *War Med*. 1945;8:244–249.

65. Compton A, Jones FD. Clinical features of young adult Hispanic psychiatric in-patients: The so-called Puerto Rican Syndrome. *Milit Med*. 1991;156(7):351–354.

66. Lempert T, Brandt T, Dietrich M, Huppert D. Psychogenic disorders of stance and gait in neurology. In: Brandt T, ed. *Disorders of Posture and Gait*. Stuttgart, Germany: G. Thieme Verlag; 1990.

67. Koller W, Lang A, Vetere-Overfield RN, Findley L, Cleever L, Factor S, Weiner W. Psychogenic tremor. *Neurology*. 1989;39:1094–1099.

68. Monday K, Jankovic J. Psychogenic myoclonus. *Neurology*. 1993;43(2):349–352.

69. Sandler SA. Camptocormia: A functional condition of the back in neurotic soldiers. *War Med*. 1945;8:26–45.

70. Miller RW, Forbes JF. Camptocormia. *Milit Med*. 1990;155(11):561–565.

71. Fahn S, Marsden CD, Calne DB. Classifications and investigations of dystonia. In: *Movement Disorders*. London, England: Butterworths; 1987.

72. Chan J, Brin MF, Fahn S. Idiopathic cervical dystonia: Clinical characteristics. *Mov Disord*. 1991;6(2):119–126.

73. Fahn S, Williams DT. Psychogenic dystonia. *Adv Neurol*. 1988;50:431–455.

74. Kramer KK, LaPiana FG, Appleton B. Ocular malingering and hysteria: Diagnosis and management. *Surv Ophthalmol*. 1979;24(2):89–96.

75. Kathol RG, Cox TA, Corbett JJ, Clancy J. Functional visual loss: A true psychiatric disorder? *Psychol Med*. 1983;13:307–314.

76. Cooper JC, Meyerhoff WL. Functional hearing loss. In: Paparella MM, Shumrick DA, Gluckman JL, Meyerhoff WL, eds. *Otolaryngology*. Philadelphia, Pa: WB Saunders Co; 1991: 1161–1165.

77. Desai BT, Porter RS, Penry JK. Psychogenic seizures: A study of 42 attacks in six patients. *Arch Neurol*. 1982;39:202–209.

78. Williamson PO, Spencer D, Spencer SS, Novelly RA, Mattson RH. Complex partial seizures of frontal lobe origin. *Ann Neurol*. 1985;18:497–504.

79. Kanner AM, Morris HH, Luders H, Dinner DS, Wyllie E, Mendendorp SV, Rowan AJ. Supplementary motor seizures mimicking pseudoseizures. *Neurology*. 1990;40:1404–1407.

80. Saygi S, Katz A, Marks DA, Spencer SS. Frontal lobe partial seizures and psychogenic seizures. *Neurology*. 1992;42:1274–1277.

81. Hodges JR, Warlow CP. The aetiology of transient global amnesia. *Brain*. 1990;113:639–657.

82. Ganser SJ. Uber einen eigenarten hysterische Dammerzustand. *Arch fur Psychiatrie Berlin*. 1898;30:633–640.

83. Whitlock FA. The Ganser Syndrome. *Br J Psychiatry*. 1967;103:19–29.

84. Latcham R, White A, Sims A. Ganser syndrome: The aetiological argument. *J Neurol Neurosurg Psychiatry.* 1978;41(9):851–854.

85. Spiegel H, Spiegel D. *Trance and Treatment: Clinical Uses of Hypnosis*. New York: Basic Books; 1978.

86. Spiegel H. The grade 5 syndrome: The highly hypnotizable person. *Int J Clin Exp Hypn*. 1974;22(4):303–319.

87. Kartchner FD, Korner IN. The use of hypnosis in the treatment of acute combat reactions. *Am J Psychiatry*. 1947;103:630–636.

88. Weinstein EA, Kahn RL, Sugarman LA, Linn L. Diagnostic use of amobarbitol sodium ("Amytal sodium"). *Am J Psychiatry.* 1953;109:889–894.

89. Weinstein EA, Kahn RL, Sugarman LA, Malitz S. Serial administration of the "Amytal test" for brain disease. *AMA Arch Neurol* [now *Arch Neurol*].1954;71:217–226.