The Intrusive Past: The Flexibility of Memory and the Engraving of Trauma

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Who can find a proper grave for the damaged mosaics
of the mind, where they may rest in pieces?
—L. L. LANGER, *Holocaust Testimonies*

The current revival of interest in the role of overwhelming experiences on the development of psychopathology has stimulated a fresh look at how memories are stored in the mind and continue to affect day-to-day perceptions and interpretations of reality. Over a century ago, the very foundation of modern psychiatry was laid with the study of consciousness and the disruptive impact of traumatic experiences. Struck by the observation that some memories could become the nucleus of later psychopathology, Jean-Martin Charcot and Pierre Janet at the Salpêtrière and William James in the United States devoted much of their attention to studying how the mind processes memories. They recognized, on the one hand, the flexibility of the mind and, on the other, how certain memories became obstacles that kept people from going on with their lives. William James wrote in 1880: "the new conceptions, emotions . . . which evolve [in the mind] are originally produced in the shape of random images, fancies, accidental outbirths of spontaneous variations . . . which the outer environment simply confirms or refutes, preserves or destroys." At the same time the psychologists and psychiatrists around the turn of the century were fully aware that some memories are not evanescent and that "certain happenings would leave indelible and distressing memories—memories to which the sufferer was continually returning, and by which he was tormented by day and by night" (Janet, 1919–25, 2:205).

Janet's Contributions

Using only careful clinical observations, these early psychologists, particularly Janet, developed a comprehensive formulation about the effects of traumatic memories on consciousness. Even though Janet's views were well known during the early part of this century (for example, he participated in the opening of the buildings of Harvard Medical School in 1908 and received an honorary doctorate during Harvard's tricentennial celebrations in 1936), and though he accurately anticipated the developments in the neurosciences in the 1970s and 1980s, his monumental legacy was crowded out by psychoanalysis, and largely forgotten, until Henri Ellenberger (1970) rescued him from total obscurity in *The Discovery of the Unconscious.* For the past seventy-five years, psychoanalysis, the study of repressed wishes and instincts, and descriptive psychiatry virtually ignored the fact that actual memories may form the nucleus of psychopathology and continue to exert their influence on current experience by means of the process of dissociation.

Janet noticed that there were marked temperamental differences between people in such areas as "psychological force" (overall energy level) and psychological tension (the capacity to focus on relevant information and utilize available data for appropriate action). Besides temperament, he viewed the memory system as the central organizing apparatus of the mind, which categorizes and integrates all aspects of experience and automatically integrates them into ever-enlarging and flexible meaning schemes (Janet, 1889; Perry and Laurence, 1984). Janet coined the word "subconscious" for the collection of automatically stored memories that form the map that guides subsequent interaction with the environment. According to Janet, the automatic transformations involved in synthesizing and adapting new perceptions into existing schemes make it extremely difficult to later decode the precise nature of any particular memory and its role in subsequent behavior (1904, 1898). Janet claimed that when people respond to new challenges with appropriate action they automatically integrate new information without paying much conscious attention to what is happening. Healthy psychological functioning depends on the proper operation of the memory system, which consists of a unified memory of all psychological facets related to particular experiences: sensations, emotions, thoughts, and actions (Janet, 1889). He quoted his former classmate, the philosopher Henri Bergson: "What characterizes the man of action is the promptness with which he can call up relevant memories, and the insuperable barrier at the threshold of consciousness produced by unrelated memories" (Bergson, 1896, 166). Janet

ed that the interplay of this memory system and temperament make person unique and complex: "The personality is a human work of art: a ruction made by human beings with the means at their disposal . . . bad, incomplete, and imperfect" (1929, 282).

inet distinguished narrative memory from the automatic integration of nformation without much conscious attention to what is happening. utomatic synthesis, or habit memory (which contemporary writers like ter (1987) call implicit memory), is a capacity humans have in common nimals. Ordinary or narrative memory, however, is a uniquely human ty. In order to memorize well, one must pay special attention to what is on. Narrative memory consists of mental constructs, which people use ke sense out of experience (e.g., Janet, 1928). Janet thought that the ease which current experience is integrated into existing mental structures ds on the subjective assessment of what is happening; familiar and able experiences are automatically assimilated without much conscious ness of details of the particulars, while frightening or novel experiences ot easily fit into existing cognitive schemes and either may be remem- with particular vividness or may totally resist integration. Under ex- conditions, existing meaning schemes may be entirely unable to modate frightening experiences, which causes the memory of these ex- ces to be stored differently and not be available for retrieval under ry conditions: it becomes dissociated from conscious awareness and ary control (Janet, 1889, 1919–25). When that occurs, fragments of nintegrated experiences may later manifest recollections or behavioral tments:

> is only for convenience that we speak of it as a "traumatic memory." he subject is often incapable of making the necessary narrative which call memory regarding the event; and yet he remains confronted by a fficult situation in which he has not been able to play a satisfactory rt, one to which his adaptation had been imperfect, so that he con- nues to make efforts at adaptation. (Janet, 1919–25, 2:274)

The Case of Irène: A Paradigm for Traumatic Memory

his frequent attempts to describe the differences between narrative ry and traumatic memory, Janet often used a clinical example that sted both: his patient Irène, a young woman of twenty-three years of o was traumatized by the tragic death of her mother of tuberculosis

(Janet, 1904, 1919–25, 1928, 1929, 1935). In the months preceding her mother's demise, Irène cared for her conscientiously. At the same time, Irène continued to work to provide for the family (her earnings were spent on her father's alcoholism and on food for her mother). She had hardly slept for sixty consecutive nights. Thus she was utterly exhausted when her mother finally died one night. Irène was unable to grasp the reality of this event; all through the night she tried to revive the corpse, trying to force it to speak, continuing to give it medications and cleaning its mouth. While this was going on, the corpse fell from the bed. Calling her father for help was of no use: he was completely drunk. She finally succeeded in putting the body straight and continued to talk to it. In the morning Irène left her house trying to get help from her aunt. However, she did not tell her that her mother was dead. Sensing something was amiss, the aunt went to the apartment, took charge of the situation, and made preparations for the funeral. Irène did not understand what was going on. Initially, she did not want to go to the funeral; during the funeral she laughed inappropriately. After a couple of weeks, her aunt brought her to Salpêtrière. The most absurd symptom, the aunt said, was that Irène, an otherwise intelligent young woman, had absolutely no memory of the death of her mother and did not want to believe that her mother had died.

During the admission, Irène could speak intelligently and was not confused. When Janet spoke with her about her mother, she said,

> If you insist on it, I will tell you: "My mother is dead." They tell me that it is so all day long, and I simply agree with them to get them off my back. But if you want my opinion, I don't believe it. And I have excellent reasons for it. If my mother was really dead, she would have been dead in her room, on a specific date, and I, who never left her and took very good care of her, would have seen it. If she was dead, they would have buried her and taken me to the funeral. Well, there has been no funeral. Why do you want her to be dead? (Janet, 1928, 207–8)

Irène gave another "excellent" reason why her mother had not died: "I love my mother, I adore her, I have never left her. If she were dead, I would despair, I would feel very sad, I would feel abandoned and alone. Well, I don't feel anything; I am not sad at all, I don't cry; thus, she is not dead." Irène returned to this point over and again. Janet could not get her to recount any memory of her mother's death. After six months of inpatient treatment and hypnotic therapy, Irène slowly started to tell the story of her mother's death. Whenever Janet returned to this subject, Irène started to cry and said:

)on't remind me of those terrible things. It was a horrible thing that appened in our apartment that night in July. My mother was dead, my ıther completely drunk, doing only horrible things to me. I had to take ıre of the deceased and all night long I did a lot of silly things in order to y to revive her. I talked to her, I wanted her to answer me, I tried to get er to drink, I tried to clean her mouth, to close her mouth and to stretch er legs. I managed to drop the corpse on the floor. I did everything to get er back on the bed and, in fact, in the morning I had more or less lost ıy mind. (Ibid., 208)

so had found the emotional part of the memory: "I feel very sad. I feel loned." According to Janet, as her memory was now accompanied by gs, it had become complete.

ınet concluded that the most striking problem of this patient was that dn't have any memories of her mother's dying. However, Irène suffered a second set of symptoms. Several times a week, the following scene)lace: whenever Irène looked from a certain direction to an empty bed, ok on a bizarre posture. She stared at the bed, without moving her eyes,)t hear anybody anymore, did not have contact with anybody, and she to engage in stereotyped activities. She brought a glass to the lips of an nary person, she cleaned her mouth, she talked with this person: "But your mouth, drink something, answer me." She climbed on the bed in to arrange the body, then she cried: "The corpse has fallen on the d and my father who is drunk, who vomits on the bed, cannot even ıe." She became busy in putting the corpse on the bed. This reproduc- f the tragic scene lasted three or four hours. It ended usually by the t looking desperate, by a convulsion, and, finally, by sleep. Irène had ılously reproduced all the details of her mother's death.

hus, Irène had two sets of symptoms: on the one hand she was amnes- the death of her mother—she could not tell the story—and on the hand she seemed to remember too much. Or did she? The reexperi- ; of the tragic night was, in fact, an exact and automatic repetition of ts Irène had performed during that night. It was automatic behavior, ırable to what all of us do while eating, walking, and so on. However, people usually introduce slight variations in these habits, Irène re- l actions in these "traumatic memories" that had been performed only on that night only. It was the reproduction of a unique sequence of

Narrative Memory versus Traumatic Memory

Janet observed the following differences between "traumatic memory" and ordinary or narrative memory. First of all, traumatic memory takes too long: in Irène's case, it took her three to four hours to tell this story. When she was finally able to tell her tale, it took her only half a minute. And this is how ordinary memory should function; it should be an aspect of life and be integrated with other experiences. Irène's "traumatic memory" clearly was not adaptive at all. After retrieving the narrative memory, she was able to give the correct answer to the question asked by her doctor: adapted to present circumstances. For instance, Irène told a slightly different story to Janet than she did to other people: with strangers, she left out her father's abominable behavior. Thus, in contrast to narrative memory, which is a social act, traumatic memory is inflexible and invariable. Traumatic memory has no social component; it is not addressed to anybody, the patient does not respond to anybody; it is a solitary activity. In contrast, ordinary memory fundamentally serves a social function, illustrated by Irène's telling people about the death of her mother as an appeal for help and reconnection.

Another distinction Janet observed is that traumatic memory is evoked under particular conditions. It occurs automatically in situations which are reminiscent of the original traumatic situation. These circumstances trigger the traumatic memory. In Irène's case, it was her position near a bed that triggered reenactment of the death scene. Traumatic memory is produced by the mechanism that Janet called *restitutio ad integrum* (Janet, 1928). When one element of a traumatic experience is evoked, all other elements follow automatically. Ordinary memory is not characterized by *restitutio ad integrum*. When Irène tells her story, she does not need to sit in front of a bed. She does not repeat the affective and motoric elements of the death scene. She just responds to a question, a question which in her case stimulated a special reaction, that is, the act of remembering.

Dissociation and Subconscious Fixed Ideas

Lack of proper integration of intensely emotionally arousing experiences into the memory system results in dissociation and the formation of traumatic memories. Janet called these new cores of consciousness "subconscious fixed ideas." Though subconscious, they continue to influence current perceptions, affect states, and behavior; they are usually accessible under hypnosis (Janet, 1894). Much of Janet's treatment of Irène consisted of

ry work under hypnosis. As her case illustrates, traumatic memories of ousing events may return as physical sensations, horrific images or nares, behavioral reenactments, or a combination of these. Since fixed ıave their origin in a failure to make sense of a past experience, they no further useful function and lack continued adaptive value. People ave learned to cope with stress by dissociation often continue to do so ɔonse to the smallest strain. Subconscious memories thus come to l ongoing behavior. People who react to stress by thus allowing the to bypass consciousness become emotionally constricted and cannot ence a full range of affects within what we would call today the same te (Janet, 1909a, 1909b). The most extreme example is multiple per- y disorder, where fixed ideas develop into entirely separate identities. ke contemporary studies which have shown that between 20 and 50 t of psychiatric inpatients suffer from dissociative disorders (e.g., Chu ll, 1990; Saxe et al., 1993), Janet, Prince (1910), and other nonpsycho- c psychiatrists noted that many patients responded to stress by dis- ıg. They reacted inappropriately to stress and behaved "automati- with irrelevant stereotypic images, ideas, emotions, and movements ɔresented fragmented reexperiences of frightening past events: "These s have a disturbance of action as well as a disorder of memory, and des the most serious trouble: that of will" (Janet, 1898, 532). Janet ed that traumatized individuals become "attached" (Freud would use n "fixated") to the trauma: unable to make sense out of the source of rror, they develop difficulties in assimilating subsequent experiences . It is "as if their personality development has stopped at a certain nd cannot expand any more by the addition or assimilation of new ts" (Janet, 1893, 138).

d's Evolution Concerning the Relevance of Traumatic Memories

choanalysis was born on the wards of the Salpêtrière; when Freud Charcot at the end of 1885, he adopted many of the ideas then current hospital, which he expressed and acknowledged in his early papers on ı (James, 1894; Freud and Breuer, 1893; Freud, 1896; Macmillan, 1990, n his later writings, he forgot these early teachings and came to view as the conquistador of entirely unexplored territories. In much of e wrote between the second half of 1892 and 1896, Freud followed ıotion that the "subconsciousness" contains affectively charged events d in an altered state of consciousness. In "On the Psychical Mecha-

nism of Hysterical Phenomena: Preliminary Communication" Freud and Breuer (1893) wrote on the nature of hysterical attacks: "We must point out that we consider it essential for the explanation of hysterical phenomena to assume the presence of a dissociation—a splitting of the content of consciousness . . . the regular and essential content of a (recurrent) hysterical attack is the recurrence of a psychical state which the patient has experienced earlier" (30). When they expanded this work in 1895, in *Studies on Hysteria*, Breuer and Freud acknowledged their debt to Janet and stated that "hysterics suffer mainly from reminiscences." Breuer's theoretical chapter in *Studies on Hysteria* shows practically no shift from the lessons from the Salpêtrière: Breuer insists that the tendency to split was basic to hysteria and that a rudimentary dual consciousness was present in every hysteria (Macmillan, 1990, 1991). An idea becomes pathogenic because it has been received during a special psychical state (a dissociated state of consciousness) and has from the first remained outside the ego. With the French, he regarded trauma-induced hysteria as state-dependent (dissociated) learning. He called this state "hypnoid" and hysteria thus was regarded as "hypnoid hysteria." Breuer thus invoked no active psychological force to keep traumatic memories apart from the ego. Like Janet, he indicated that hysterical phenomena had a traumatic origin and stated that these memories "originated during the prevalence of severely paralyzing affects, such as fright." Starting in 1895 Freud developed the new concept of defense hysteria, which he postulated as not having its origin in dissociated states of consciousness: "I have never in my own experience met with a genuine hypnoid hysteria." With this declaration, Freud took his first steps away from the theories of trauma-induced dissociation and hysteria of Charcot, Janet, and Breuer. "He denied that dissociation was fundamental and had come to view all so-called hypnoid symptoms as really caused by repression" (Macmillan, 1991, 101).

As late as 1896, in "The Aetiology of Hysteria," Freud quite categorically proposed the extreme view that: "the ultimate cause of hysteria is always the seduction of a child by an adult. The actual event always occurs before the age of puberty, though the outbreak of the neurosis occurs after puberty. The symptoms of hysteria can only be understood if they are traced back to experiences which have a traumatic effect." In the dramatic *volte face* on this "seduction theory," Freud renounced his previously very passionately held belief that childhood sexual trauma was at the origins of hysterical neuroses, and with that, he lost interest in exploring dissociated states of consciousness. During the latter part of the 1890s, Freud changed his position to one in which he held that patients actively repressed memories of conflictual

nstinctual wishes. Rather than ascribing hysteria to trauma, he proposed hat the capacity for conversion is the basic predisposition to hysteria (Macnillan, 1990, 1991). He henceforth argued that the memory disturbances and eenactments seen in hysteria were not the result of a failure to integrate new ata into existing meaning schemes but of the active repression of conflictıden sexual and aggressive ideas and impulses, centering on the oedipal risis at about age five. In, for example, *The Interpretation of Dreams* (Freud, 900), he clearly (and erroneously) claimed that infantile memories are :ored in memory, but remain unavailable for retrieval because of actively :pressed, forbidden impulses and wishes. While psychoanalysis thereby ame to emphasize the force of forbidden wishes, it ignored the continued ower of overwhelming terror. Psychoanalysis came to dismiss the terrifying :ality of many patients' experiences and the profession disregarded such rofoundly shocking experiences as incest with statements such as "she is pset, because her oedipal wishes came true."

It seems that Freud revisited the conception of dissociation only once ıore, in 1936: "Depersonalization leads us to the extraordinary condition of ouble consciousness, which is more correctly described as split personality. ut all of this is so obscure and had been so little mastered scientifically that I ıust refrain from talking about it anymore." However, the reality of actual auma in the genesis of psychopathology could not be entirely swept under ıe rug: after the First World War, psychoanalysis was faced with the dual ıallenge of explaining men's infinite capacity for self-destruction, and the ality of combat neuroses. In the foreword to the Ferenczi et al. monograph ı war neuroses (1919), Freud stated that "the symptomatic picture prented by traumatic neurosis approaches that of hysteria . . . but surpasses it a rule in its strongly marked signs of subjective ailment in which it sembles hypochondria or melancholia as well as the evidence it gives of a r more comprehensive general enfeeblement and disturbance of mental pacities." Ferenczi et al. traced many of the motor symptoms of paralysis in e war neuroses to a fixation on the moment that the trauma occurred. eud was struck by the fact that patients suffering from traumatic neuroses perienced a lack of conscious preoccupation with the memories of their cident. He postulated that "perhaps they are more concerned with *not* inking of it."

In *Inhibitions, Symptoms, and Anxiety* (1926), Freud returned to Janet's ıtion of attachment to the trauma. He proposed that the compulsion to ɔeat the trauma is a function of repression itself: "We found that the

perceptual content of the exciting experiences and the ideational content of pathogenic structures of thought were forgotten and debarred from being reproduced in memory, and we therefore concluded that the keeping away from consciousness was the main characteristic of hysterical repression" (163). And, he noted a few years earlier that because the memory is repressed, the patient "is obliged to repeat the repressed material as a contemporary experience, instead of . . . remembering it as something belonging to the past" (1920, 18).

Psychodynamic psychiatry has always attached crucial importance to the capacity to reproduce memories in words and to integrate them in the totality of experience, i.e., to narrative memory. In *L'Etat mental des Hystériques,* Janet said "it is not enough to be aware of a memory that occurs automatically in response to particular current events: it is also necessary that the personal perception 'knows' this image and attaches it to other memories" (1911, 538). In *Inhibitions, Symptoms, and Anxiety,* Freud claimed that, if a person does not remember, he is likely to act out: "he reproduces it not as a memory but as an action; he repeats it, without knowing, of course, that he is repeating, and in the end, we understand that this is his way of remembering" (1926, 150). Thus, both Freud and Janet claimed that the crucial factor that determines the repetition of trauma is the presence of mute, unsymbolized, and unintegrated experiences: "a sudden and passively endured trauma is relived repeatedly, until a person learns to remember simultaneously the affect and cognition associated with the trauma through access to language" (van der Kolk and Ducey, 1989, 271).

In his last published writing during his lifetime, Freud revisited the power of unverbalized memories, maybe unconsciously returning to his own "repressed" early lessons from the Salpêtrière. In *Moses and Monotheism* (Freud, 1939) he claimed that:

> what children have experienced at the age of two and have not understood, need never be remembered by them, except in dreams. . . . But at some later time it will break into their life with obsessional impulses, it will govern their actions. The precipitating cause, with its attendant perceptions and ideas, is forgotten. This, however, is not the end of the process: the instinct has either retained its forces, or collects them again, or it is reawakened by some new precipitating cause . . . at a weak spot . . . [it] comes to light as a symptom, without the acquiescence of the ego, but also without its understanding. All the phenomena of the formation of symptoms may be justly described as the "return of the repressed." (124)

re acquired by repetition (Bransford and Johnson, 1972; Schacter, 1987). People who possess a prior store of information about a particular area of nowledge tend to integrate new data related to that subject more easily than lo people who have little or no prior knowledge. It is now widely accepted hat memory is an active and constructive process and that remembering epends on existing mental schemas, "an active organization of past reac- ions or of past experiences which must always be operating in any well- dapted organic response" (Bartlett, 1932, 201; Schacter, 1987; Neisser, 1967). . M. Mandler (1979, 263) said that "a schema is formed on the basis of past xperience with objects, scenes, or events and consists of a set of (usually nconscious) expectations about what things look like and/or the order in hich they occur. The parts or units of a schema consist of a set of variables, r slots, which can be filled or instantiated in any given instance by values iat have greater or lesser degrees of probability of occurrence attached to iem." In other words, preexisting schemes determine to what extent new iformation is absorbed and integrated.

New experiences can only be understood in the light of prior schemas. he particular internal and external conditions prevailing at the time an ent takes place will affect what prior meaning schemes are activated (Janet ready observed that events are much more likely to be experienced as aumatic when a person is tired, ill, or under stress [Janet, 1889, 1898]). Early i this century, gestalt psychology emphasized that all experiences consist of itegrated structures or patterns that must be apprehended as wholes rather ian as their disconnected parts. Subsequent research has shown that only ter an experience is placed in a meaningful context can inferences and ipositions about the meaning of an event be made (Schacter, 1987). As I. Minsky (1980) puts it: "so we shall view memories as entities that pre- spose the mind to deal with new situations in old, remembered ways— ecifically, as entities that reset the states of parts of the nervous system. hen they can cause that nervous system to be 'disposed' to behave as ough it remembers."

The mind organizes new sensory information into preexisting patterns: he pattern is the message" (Young, 1987). Janet anticipated this when he id:

> The person must not only know how to do it, but must also know how to associate the happening with the other events of his life, how to put it in its place in that life-history which each one of us is perpetually building up and which for each of us is an essential element of his personality. A situation has not been satisfactorily liquidated, has not been fully assimilated, until we have achieved, not merely through our movements, but also an inward reaction through the words we address to ourselves, through the organization of the recital of the event to others and to ourselves, and through the putting of this recital in its place as one of the chapters in our personal history. (1919–25, 2:273)

This principle of organization of experience in patterns and schemas has been called many things, including population codes, parallel processing, and distributed functions. The understanding of this principle has given rise to the new science of neural networks, which works on the basis of the notion that, while neurons are the anatomical units of the nervous system, they are not the structural elements of its functioning. Populations of neurons work together to discriminate patterns. These cannot be further subdivided into separate neurons for the details of a particular sensory impression. These unconscious memory processes function in domain-specific divisions, such as musical, athletic, mathematical, knowledge of the self, and so on (Gardner, 1987). Only some modules seem to have access to others, and only a few come under voluntary control. Parallel processing allows information to be processed very rapidly within one module. Only after a bit of information is unconsciously analyzed does it, when suitable, become accessible to consciousness. On the other hand, when there are problems with categorization because of difficulties in interpreting the nature of the incoming stimulus, consciousness also gets activated. On the whole, however, most processing of incoming information remains outside of conscious awareness. None of this has anything to do with internal conflicts and unacceptable wishes.

Memories easily become inaccurate when new ideas and pieces of information are constantly combined with old knowledge to form flexible mental schemas. As Janet pointed out a century ago, once a particular event or bit of information becomes integrated in a larger scheme it will no longer be accessible as an individual entity, and hence, the memory will be distorted (1889). Edward O. Wilson (1978) put it most poetically when he said that "the brain is an enchanted loom where millions of flashing shuttles weave a dissolving pattern. Since the mind recreates reality from the abstractions of sense impressions, it can equally well simulate reality by recall and fantasy. The brain invents stories and runs imagined and remembered events back and forth through time."

How the Mind Comes to Freeze Some Memories

As we have seen, almost all memories are malleable by constant rework-g and recategorization. Yet some memories are fixed in the mind and are ɔt altered by the passage of time, or the intervention of subsequent experi-ce. In our studies on post-traumatic nightmares, traumatic scenes were ɛxperienced at night over and over again without modification (van der ɔlk et al., 1984). In our Rorschach tests of trauma victims, we saw an ımodified reliving of traumatic episodes of ten, twenty, or thirty years ago ın der Kolk and Ducey, 1989). So how does memory occasionally escape tegration and, instead, get "fixed" to resist further change?

One way in which this occurs is by myelinization: developmentally, the ain is extremely plastic until myelinization, which occurs in different parts the brain at different ages but which is complete by the end of puberty, ıigns specific functions to particular parts of the CNS. Binocular vision, ɛech, and even attachment patterns depend on myelinization during criti- periods (van der Kolk, 1987). Modern research (Jacobs and Nadel, 1985; hacter and Moscovitch, 1984) indicates that infantile amnesia is the result lack of myelinization of the hippocampus. Even after the hippocampus is ʹelinized, the hippocampal localizaton system, which allows memories to placed in their proper context in time and place, remains vulnerable to ıruption. Severe or prolonged stress can suppress hippocampal function-ȝ, creating context-free fearful associations, which are hard to locate in ıce and time. This results in amnesia for the specifics of traumatic experi-ɛes but not the feelings associated with them (Nadel and Zola Morgan, ʹ4; Sapolsky et al., 1984). Cognitive psychologists have identified three ɔdes of information encoding in the CNS: inactive, iconic, and sym-lic/linguistic (Bruner and Postman, 1949). These different modes reflect ges of CNS development (Piaget, 1973). As they mature, children shift m primarily sensorimotor (motoric action), to perceptual representations ɔnic), to symbolic and linguistic modes of organizing mental experience. ıen people are exposed to trauma, that is, a frightening event outside of linary human experience, they experience "speechless terror" (van der lk, 1987). The experience cannot be organized on a linguistic level, and ı failure to arrange the memory in words and symbols leaves it to be ;anized on a somatosensory or iconic level: as somatic sensations, be-ʹioral reenactments, nightmares, and flashbacks (Brett and Ostroff, 1985). Piaget (1962) pointed out: "It is precisely because there is no immediate ommodation that there is complete dissociation of the inner activity from

the external world. As the external world is solely represented by images, it is assimilated without resistance (i.e., unattached to other memories) to the unconscious ego." They therefore cannot be easily translated into the symbolic language necessary for linguistic retrieval.

Hyperarousal, Triggering, and State-Dependent Learning

Another way in which memories can be "fixed" is by the occurrence of intense autonomic activation at the time that an event occurs. Janet (1889, 1894) noted that intense arousal ("vehement emotions") interferes with proper information processing and appropriate action, and that trauma could lead to both hypermnesias and amnesias. Current research has shown (DSM IV Field trials, 1991) that hypermnesias are more common after one time traumatic events, particularly in adults, while chronic amnesias tend to occur after repeated traumatization in childhood. One of the hallmarks of Post-Traumatic Stress Disorder is the intrusive reexperiencing of elements of the trauma in nightmares, flashbacks, or somatic reactions. These traumatic memories are triggered by autonomic arousal (Rainey et al., 1987; Southwick et al., 1993) and are thought to be mediated via hyperpotentiated noradrenergic pathways originating in the locus coeruleus of the brain (van der Kolk et al., 1985). The locus coeruleus is the "alarm bell" of the CNS, which properly goes off only under situations of threat, but which, in traumatized people, is liable to respond to any number of triggering conditions akin to the saliva in Pavlov's dogs. When the locus coeruleus alarm gets activated, it secretes noradrenaline, and, if rung repeatedly, endogenous opioids. These, in turn, dampen perception of pain, physical as well as psychological (van der Kolk et al., 1989). These neurotransmitters, which are activated by alarm, affect the hippocampus, the amygdala, and the frontal lobes, where stress-induced neurochemical alterations affect the interpretation of incoming stimuli further in the direction of "emergency" and fight-or-flight responses.

Animal research has shown that, once the memory tracts have been activated under conditions of severe stress, subsequent high-intensity stimuli will preferentially travel along the same pathways, activating the memories that were laid down under similar conditions (long-term potentiation; see ibid.). High degrees of stress cause state-dependent returns to earlier behavior patterns in animals as well. D. Mitchell and his colleagues (1984, 1985) found that arousal state determines how animals will react to stimuli. In a state of low arousal, animals tend to be curious and seek novelty. During high arousal they are frightened, avoid novelty, and perseverate in familiar

iavior regardless of the outcome. Under ordinary circumstances, an ani- l will choose the most pleasant of two alternatives. When hyperaroused, it l seek the familiar, regardless of the intrinsic rewards (Mitchell et al., 5). Thus, shocked animals returned to the box in which they were origi- ly shocked in preference to less familiar locations not associated with iishment. Punished animals actually increased their exposure to shock as trials continued (Mitchell et al., 1984).

It is likely that in people, just as in animals, long-term potentiation of ironal connections made during intense autonomic hyperarousal is at the e of the repetitive, fixed, intrusive reliving of traumatic memories when ple later find themselves in a state that resembles the original one (van Kolk et al., 1985; Putnam, 1989). Cognitive psychologists have found that rceptual processing automatically activates preexisting semantic memory ictures corresponding to the features of the stimulus event, as well as ted nodes by virtue of spreading activation. If some of these nodes corre- nd to the goals and conditions of various production systems, certain cedures will (automatically) be executed" (Kihlstrom, 1984, 447) without scious awareness of the processes involved. Previously traumatized peo- are vulnerable to experience current stress as a return of the trauma.

In traumatized people, visual and motoric reliving experiences, night- es, flashbacks, and reenactments seem to be preceded by physiological isal. Yale researchers Southwick and his colleagues (1993) have recently vincingly shown that autonomic stimulation (by injection of yohimbine) ses people with PTSD to immediately access sights, sounds and smells ted to earlier traumatic events. The general state of physiologic arousal, vation of particular neurotransmitter systems, and access to particular nory tracks all seem to be intertwined.

Thus, in the latter part of this century, we are rediscovering that the eval of memories and trauma-related states is to a large degree state endent (Bower, 1981; Putnam, 1989). E. Tulving (1983, 242) has been able emonstrate that remembering events always depends on the interaction veen encoding and retrieval conditions, or compatibility between the am and the cue. The more the contextual stimuli resemble conditions ailing at the time of the original storage, the more retrieval is likely. s, memories are reactivated when a person is exposed to a situation, or is somatic state, reminiscent of the one when the original memory was ed. Janet described the fact that traumatized people lose track of current encies, and respond instead, as if faced with past threat: (they have) "lost mental synthesis that constitutes reflective will and belief; [they] simply

transform into automatic wills and beliefs the impulses which are momentarily the strongest" (1907, xxi, xxii).

The fact that traumatized people experienced, and continue to experience, extremes of hyperarousal and numbing is compatible with the notion that they are amnestic for certain aspects of their experience at any particular time. In line with this, M. Bower (1981) has suggested that multiple personality amnesia is an extreme manifestation of state-dependent retrieval, whereby information acquired in one emotional state is inaccessible in another. Since traumatic memories are state dependent, Janet drew the conclusion that patients needed to be brought back to the state in which the memory was first laid down in order to create a condition in which the dissociated memory of the past could be integrated into current meaning schemes (1895, 1889, 1904, 1894, 1989a, 1898b).

Action Is Necessary for Integration

Janet made one other observation which is relevant to the fixing and dissociation of traumatic memories. He thought that successful action of the organism upon the environment is essential for the successful integration of memories: "the healthy response to stress is mobilization of adaptive action" (1909b, 1575). He even viewed active memory itself as an action: "memory is an action: essentially, it is the action of telling a story" (1919–25, 2:272). This notion keeps coming back in the works of modern neurobiologists. For example, Edelman states that "action is fundamental to perception: both sensory and motor ensembles must operate together to produce perceptual categorization" (1987, 238). Many writers about the human response to trauma have observed that a feeling of helplessness, of physical or emotional paralysis, is fundamental to making an experience traumatic (e.g., Maier and Seligman, 1976; van der Kolk, 1987): the person was unable to take any action that could affect the outcome of events. It is likely that psychological and physical immobilization indeed is a central feature of the impairment of appropriate categorization of experience, and may be fundamental to the development of hypermnesia and dissociation. Oliver Sacks, in *Awakenings* (1990), provides rich clinical material that illustrates how experience, unless acted upon, cannot be integrated into existing meaning schemes.

Conclusions

After a long hiatus, the memories that plague people have once again become a focus of investigation in psychology and psychiatry. While losing

of the rich knowledge base about the role of memory in psychopathol-
which evolved around the turn of this century, psychoanalysis has, by
ighting the unavoidable conflicts between individual desires and the
nds of a civilized society, held the torch for listening carefully to people's
nal transformations of external experience. Contemporary neuro-
ce, also unaware of the earlier observations, has slowly started to focus on
s that preoccupied the founders of modern psychiatry and, with contem-
y research methodology, is arriving at similar conclusions as they did. At
ame time, psychiatry is beginning to rediscover the reality of trauma in
le's lives, and the fact that actual experiences can be so overwhelming that
cannot be integrated into existing mental frameworks and, instead, are
ciated, later to return intrusively as fragmented sensory or motoric
iences. We are rediscovering that some experiences are encoded in
ory, but not in such a way that people can acknowledge and accept what
ened to them and go on with their lives (Schacter et al., 1982).

Traumatic memories are the unassimilated scraps of overwhelming ex-
nces, which need to be integrated with existing mental schemes, and be
formed into narrative language. It appears that, in order for this to
successfully, the traumatized person has to return to the memory often
der to complete it. Janet's case of Irène illustrates a situation in which
ntegration initially was totally absent: Irène had complete amnesia for
eath of her mother and only experienced traumatic reenactments. This
lso illustrates the fear and repugnance with which traumatized persons
nd when confronted with their hitherto dissociated traumatic memo-
They suffer, as Janet (1904) said, from a *phobia for the traumatic memory.*
ne's case, overcoming this phobia was extremely difficult. When she
already accept the memory of her mother's death in the hypnotic state,
itially responded in the waking state with syncopal attacks and crises in
a she again reenacted the tragedy. Other traumatized persons may
lly respond with suicide attempts or other self-destructive behavior.

n the case of complete recovery, the person does not suffer anymore
the reappearance of traumatic memories in the form of flashbacks,
ioral reenactments, and so on. Instead the story can be told, the person
ok back at what happened; he has given it a place in his life history, his
iography, and thereby in the whole of his personality. Many trau-
ed persons, however, experience long periods of time in which they
s it were, in two different worlds: the realm of the trauma and the realm
ir current, ordinary life. Very often, it is impossible to bridge these
s. This is most eloquently described by L. L. Langer (1991) in his study

on oral testimonies by Holocaust survivors who never succeeded in bridging their existence in the death camps and their lives before and after. "It can . . . never be joined to the world he inhabits now. This suggests a permanent duality, not exactly a split or a doubling but a parallel existence. He switches from one to the other without synchronization because he is reporting not a *sequence* but a *simultaneity*" (95). This simultaneity is related to the fact that the traumatic experience/memory is, in a sense, timeless. It is not transformed into a story, placed in time, with a beginning, a middle and an end (which is characteristic for narrative memory). If it can be told at all, it is still a (re)experience.

> Witnesses are both willing and reluctant to proceed with the chronology; they frequently hesitate because they know that their most complicated recollections are unrelated to time. . . . [Trauma] stops the chronological clock and fixes the moment permanently in memory and imagination, immune to the vicissitudes of time. The unfolding story brings relief, while the unfolding plot induces pain. (ibid., 174–75)

Switching from one's present-day world to the world of traumatic memory does not only imply the simultaneity of two utterly incompatible worlds, of an ordinary and a traumatic state of mind. As the trauma is fixed at a certain moment in a person's life, people live out their existences in two different stages of the life cycle, the traumatic past, and the bleached present. The traumatized, fixated, inflexible part of the personality has stopped developing (Janet, 1898b, 1904). This is a major complication in the attempt to bridge the two realms of experience. Langer (1991) hints at this in his comments on one Holocaust survivor's report:

> The bizarre spectacle of an adult speaking of a seven-year-old child meeting his parents [during a traumatic meeting directly after liberation] remembering his five-year-old self [as a member of street gangs of orphaned or vagrant children] as an unrecapturable identity reminds us of the complex obstacles that frustrate a coherent narrative view of the former victim's ordeal from the vantage point of the present. (112)

In even more extreme cases, in people with multiple personality disorder, the adult self may be entirely unaware of his childhood trauma, which then can only be related when the traumatized seven-year-old dominates consciousness ("has executive power"). She either reexperiences the trauma in its totality (as did Irène) or fluctuatingly and opaquely "senses" autobiographical episodes.

Thus, one extreme post-traumatic state consists of living in the unre-

bered past, reenacting in contemporary reality past traumatic experi-
, as did Irène. A different state consists of a continuous switching from
nternal world to another, as described by a survivor of Auschwitz
ed in ibid., 6): "I live in a double existence. The double of Auschwitz
't disturb me or mingle with my life. As if it weren't 'me' at all. Without
plit, I wouldn't have been able to come back to live." But when the
n is (partially) aware of his traumatic memories, for example, of the
:aust, then the meaning schemes with which current experiences are
'ated correspond to traumatic experiences. They often can tell the story
ir traumatization with a mixture of past and present, but their current
characterized by doubt and humiliation, by feelings of guilt and
:: past meaning schemes determine the interpretation of the present.
.s not only the case in Langer's witnesses of the Holocaust but also in
otherwise traumatized persons, such as incest victims and combat
ns suffering from PTSD.

eing unable to reconcile oneself to the past is at least in part dependent
the objective nature of the trauma. Can the Auschwitz experience and
ss of innumerable family members during the Holocaust really be
ated, be made part of one's autobiography? Every therapist working
traumatized people is familiar with the patient's deep despair and
sh when faced with their horrendous life histories. How can one bring
aumatic experience to an end, when one feels completely unable and
ling to resign oneself to the fact that one has been subjected to this
ıdous event or series of events? How can one resign oneself to the
eptable? Both Janet and many contemporary psychotherapists have
o assist their patients in realizing this act of termination, by suggesting
m an alternative, less negative or even positive scenario. Janet sug-
to his patient Justine, who was traumatized at age seventeen by the
of horrendous nude corpses of victims of a cholera epidemic, to visual-
:se corpses with clothes on. He even suggested that one, dressed in the
m of a Chinese general, got up and walked away. One contemporary
ist of a Holocaust survivor had the patient imagine a flower growing in
signment place in Auschwitz—an image that gave him tremendous
rt. Many patients who are victimized by rape and other forms of
ce are helped by imagining having all the power they want and apply-
to the perpetrator. Memory is everything. Once flexibility is intro-
, the traumatic memory starts losing its power over current experience.
agining these alternative scenarios, many patients are able to soften the
ve power of the original, unmitigated horror.

The question arises whether it is not a sacrilege of the traumatic experience to play with the reality of the past? Janet (1919–25) provided one example that illustrates the usefulness of such a therapeutic approach in some cases (cf. van der Hart et al., 1990). His case example concerns a thirty-one-year-old woman who had lost her two infants in close succession. She was in constant despair and suffered gastrointestinal cramps and vomiting. She was admitted to the Salpêtrière, emaciated, preoccupied with reminders of her children, and regularly hallucinating realistic scenes of their deaths. Janet began treatment by having her give him the reminders for safekeeping. Using hypnotic suggestion, he substituted her traumatic death images with those of flowers. He then made them fade away altogether. Subsequently, Janet focused her attention on the future and on her being trained in midwifery. At one-year follow-up, she was working again and was considered to be cured.

Recently, the psychoanalyst A. Modell (1990), deeply conversant with psychoanalysis, and knowledgeable about Edelman's work, has started to integrate some of the new knowledge of neuroscience with the clinical practice of psychoanalysis, focusing particularly on the nature and meaning of the transference. He considers that traumatic or unassimilated memories are activated in the transference, where "units of experience of the past [are] brought into present time. When the archaic affect category predominates over current perceptions, it may contribute to the psychopathology of everyday life" (1990, 66). He considers that at the core of healing in the therapeutic relationship is the fact that "Affects are communicative and contagious, so that the other person is involved in the affective repetition and will collude, either consciously, or unconsciously, in confirming or disconfirming the subject's category of perception" (68). "The process of disconfirmation of the painful past interactions (in the therapy situation) is essentially a process of retranscription [of meaning schemes]." His work illustrates the reality that the trauma, almost inevitably, will be revived in the therapeutic relationship and that the meaning schemes built around the traumatic experiences will be activated in the form of irrational perceptions and fears. The taming and utilization of these transference expressions of the trauma to integrate past horror with current experience is one of the great challenges in the therapy of traumatized patients.

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Notes on Trauma and Community

KAI ERIKSON

In the past several years, research errands of one kind or another have taken me to the scene of a number of different human catastrophes—a mountain hollow in West Virginia called Buffalo Creek visited by a devastating flood; a town in southern Florida called Immokalee, where 200 migrant farmworkers from Haiti were defrauded of their meager savings; the ring of neighborhoods surrounding Three Mile Island; an Ojibway Indian reserve in northwest Ontario called Grassy Narrows that experienced not only the contamination of its local waterways but a disastrous relocation; and a housing development in Colorado called East Swallow plagued by an underground gasoline leak. It has seemed to me throughout that some form of the term "trauma" is the most accurate way to describe not only the condition of the people one encounters in those scenes but the texture of the scenes themselves. The term itself, however, is used in so many different ways and has found a place in so many different vocabularies that it is hard to know how to make of it a useful sociological concept. So I begin with matters of definition.

Trauma is generally taken to mean a blow to the tissues of the body—or more frequently now, to the tissues of the mind—that results in injury or some other disturbance. Something alien breaks in on you, smashing through whatever barriers your mind has set up as a line of defense. It invades you, takes you over, becomes a dominating feature of your interior landscape—"possesses" you, Cathy Caruth says in the introduction to Part I of this volume—and in the process threatens to drain you and leave you empty. The classic symptoms of trauma range from feelings of restlessness