# the culture of pain

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TO EMILY B. MORRIS & ALLSTON J. MORRIS, M.D.

# 7
# PAIN IS ALWAYS IN YOUR HEAD

When you feel a pain in a leg that has been amputated, where is the pain? If you say it is in your head, would it be in your head if the leg had not been amputated? If you say yes, then what reason have you ever for thinking you have a leg?

BERTRAND RUSSELL[1]

SOMETIMES THE MOST obvious questions, as Job discovered, prove hardest to answer. "Where does it hurt?" must be one of the oldest medical questions on record, and usually we can give a clear, if slightly annoyed, response. "It hurts *here*!"—and we point a finger to the spot. Obviously a headache refers to pain in the head, a backache refers to pain in the back. Common sense demands as much or else we might as well start playing croquet with flamingos. But common sense is notoriously weak when it comes to confronting a mystery. In fact, a mystery, as distinguished from a puzzle, might be defined as whatever refuses to yield up all its secrets to common sense. Sometimes we may encounter unexpected difficulty in saying exactly where it hurts. Sometimes a pain that starts in the lower back begins to slip around toward the hip, or suddenly shoots down the leg. Consider the strange case of phantom limb pain.

Phantom limb pain is one of the most elusive afflictions in the repertoire of human illness. It occurs in amputees. There would seem to be suffering enough in the events that surround the loss of a limb, yet for most amputees an even worse trial lies ahead. After surgery, almost all amputees report feeling an *invisible* limb in the empty space once occupied by the amputated hand or leg or foot. As Ronald Melzack explains: "The limb is usually described as having a tingling feeling, a definite shape, and capable of making a variety of movements."[2] The patient can



see clearly that the leg, say, ends in a stump. The tingling is equally clear, however, and it has a specific location: in the unseen foot. For 5 to 10 percent of all amputees, this so-called phantom limb—composed of sheer blank space—hurts with an excruciating pain.

Patients usually describe the pain of phantom limbs as cramping, shooting, burning, or crushing, but ordinary language begins to fail in an experience so far beyond the reach of common sense. One man described his state as follows: "When the pain comes on I'd as soon be dead. It's like something trying to escape out of the end of the stump, it shoots down the end of your leg and feels as if someone's trying to pull your leg off . . . like an electric shock. . . . I could really scream at times with the pain. . . . It feels as if someone's sawing it off, very, very painful."[3] We come to trust that pain, among its most familiar traits, is *localizable*, unlike (say) anxiety. We can rub the spot that hurts and often it will feel better. Phantom limbs, against all the evidence of everyday experience, enclose their pain within parts of the body that no longer exist.

Phantom limb pain persists for a year or more in 3 to 7 percent of all amputees. Sometimes it lasts for decades. For example, amputees may feel the fingers of the missing hand turned inward and digging into the palm. Absent toes may seem twisted and cramped ("bunched up"). An entire missing leg can feel icy or burning. A nonexistent wedding ring may still supply its reassuring pressure around a nonexistent finger. We lack a widely accepted explanation for this enigmatic malady. Some researchers propose simple physiological causes, such as nerve entrapment in the stump, while others suggest complex psychological and psychosocial origins related to the trauma of loss.[4] Medical opinion now seems to favor the idea of multiple causes involving interaction among the peripheral, sympathetic, and central nervous systems. Meanwhile phantom limb pain remains for the person who suffers it an inexplicable catastrophe.

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Phantom limb pain offers probably the most vivid and puzzling illustration of the perverse statement that pain is always in your head. In what follows, I want to explore several other contexts that help make such a claim seem less obviously irrational: an episode (from the modern history of childbirth) known as "twilight sleep"; an encounter with the meditations of the Roman emperor Marcus Aurelius; a visit to a pain clinic in

Durango, Colorado; and a return to the writing of well-known Viennese neurologist and psychiatrist, Viktor Frankl, who survived three years in Nazi death camps. The evidence from such diverse sources may serve to shake up or derail the automatic modern assumption, reinforced by at least two centuries of medical thought, that pain belongs strictly and solely to the mechanisms of the body. I am contending—to the contrary—that pain shows us how far body and mind are inextricably bound together.

We cannot appreciate the mind's contribution without first understanding how pain anchors itself in the human body.[5] The mind, after all, depends upon the brain, and the brain belongs to the central nervous system, which holds major responsibility for the transmission of pain impulses. Although we have learned an immense amount recently about the various interior pathways, no one can yet provide an absolutely perfect explanation of how pain impulses travel to the brain. Experiments show, however, that tissue damage creates three very different kinds of pain. This classification, which extends back to the time of Holmes and Head, would instruct us to distinguish the following broad types:

1. pricking pain (felt most commonly when we break or irritate the skin);
2. burning pain (also felt most commonly when the skin is involved);
3. aching pain (felt most commonly deep inside the body).

Pricking pain travels to the brain through small nerve fibers called A delta fibers. Aching pain and burning pain (which of course is not limited to actual burns) travel through even smaller, slower nerve fibers called C fibers; hence the lag between touching a stove and feeling the hurt.[6] We now have a pain impulse and a pain pathway, but we still do not have pain.

Pain most commonly occurs when the pain impulse travels across three crucial sites: the injured tissue, the spinal column, and the brain. Several important cautions are required, however, before we proceed to follow the pain impulse in its travels. First, we are talking here about acute pain only. What happens in chronic pain is far more complex and less well understood. Second, the pathways leading from the injured tissue to the brain are both multibranched and bidirectional. We cannot think of the nervous system as composed of the long, unbroken tubes that Descartes



imagined running directly from the point of injury to the brain. The brain and spinal column, moreover, signal information back to the injured tissue in a two-way traffic. A highly simplified version of this complicated back-and-forth progress would include the following details.

At the site of injury, chemicals released by the damaged tissue trigger a series of events that amplify the pain signal. The most important of these chemical amplifiers are called prostaglandins and bradykinin. We now know that aspirin—for years a puzzle to science—works by inhibiting the operation of prostaglandins. Today, of course, researchers are looking hard for ways to block the operation of bradykinin, which is the most potent pain-producing substance yet discovered.[7] So long as it is unblocked, the chemical chain-reaction set in process at the site of injury sends the amplified impulses racing along the A delta or C fibers toward the spinal column.

At the exterior of the spinal column, the amplified pain impulse enters a crucial region known as the dorsal horn. What happens here and elsewhere in the spinal cord itself is not entirely clear. We know that the spinal cord releases chemicals called neurotransmitters that relay the message onward. There are two main tracks on which the pain impulse runs within the spinal cord: the neospinothalamic pathway (for sharp, localized pain) and the paleospinothalamic tract (for less localized, dull or burning pain). It is clear that the spinal column contains its own mechanisms—especially a neurotransmitter called Substance P—for reducing or blocking pain impulses, but let us assume that the nociceptive impulse, as it is technically called, continues to speed onward toward the brain.

The brain confronts researchers with abundant unanswered questions about pain, but we now know a number of clear facts. Sharp pain and dull pain proceed on different paths to the thalamus and then continue on to the cerebral cortex. At some point they connect with the limbic system, which controls our emotional responses. (Aristotle thus was not so far off in classifying pain as an emotion.) The most exciting recent breakthrough, as we have seen, concerns the discovery that the brain produces opiatelike peptides called endorphins, enkephalins, and dynorphins: natural analgesic substances that bind to receptors in the brain exactly like morphine. Thus the same impulse that reaches the brain to produce the perception of injury can also, under specific circumstances, trigger the release of a natural analgesic to erase it. Let us assume that the endorphins

have gone on strike. When the well-traveled nociceptive impulse from the broken toe reaches the brain, suddenly you have just entered the familiar state called pain.

This simplified account, I must stress, concerns an episode of acute pain. We cannot assume that chronic pain follows exactly the same model. Further, it leaves out various other intersecting systems for transmitting, suppressing, and influencing pain, in particular the sympathetic and parasympathetic systems that regulate circulation, breathing, digestion, and the genito-urinary functions. The pain impulse, further, far from always following a direct route to the brain, often seems to employ a path more like a complex network of crisscrossing highways. If you cut off the interstate route with a nerve block, the nociceptive impulse will frequently take to the back roads. Further, impulses *descending* from the brain may suddenly shut down all traffic, even to the point of inducing a profound analgesia. Ronald Melzack and Patrick D. Wall had something like this two-way model in mind when they proposed their well-known "gate-control" theory of pain.

What this artificial account lets us see clearly, first, is how far pain depends on the unseen biochemical processes within our bodies. Second, it emphasizes that pain does not exist until the nerves and neurotransmitters convey their information to the brain. It is the brain, ultimately, that allows us to feel pain. If we anesthetize the brain, the pain disappears. Indeed, researchers can produce pain behavior in rats without any side trips through the spinal column or through the peripheral nervous system. They simply attach their electrodes directly to the rat's brain and the pain flows. The brain of course does not suffer painful tissue damage in this process, as it contains no free nerve endings to communicate pain. (Thus brain surgery can proceed with the patient wide awake.) The pain flows because its point of origin lies within the very structure of the brain.

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Our imperfect knowledge of pain impulses as they travel through the nervous system gets sketchy—and at points turns into educated guesswork—when we reach the higher centers of processing, especially the thalamus and cerebral cortex. The human brain is still a moonscape of uncharted fields. Research most often proceeds on animals such as cats and rats, where what we learn through counting tailflicks may not translate directly into a knowledge of human pain. Further, psychologists



trained to analyze stimulus and response often find the cerebral cortex a black box full of mysteries that they prefer to leave alone. Thus, although we can now fill volumes with what we know about pain impulses as they travel toward the spine and enter the dorsal horn of the spinal column, we are still comparatively mute about the most important point in the entire process: the relation of pain to mind and brain.

Here is an idea guaranteed to set pain specialists on edge. Human brains, as if implanted with their own electrodes, seem able to produce pain in the absence of tissue damage. Such usually chronic pain is called (among other less explicit names) "psychogenic." Psychogenic pain means pain created or sustained by the mind. Traditional medicine, not surprisingly, does not know what to do with psychogenic pain, except to deny that it exists; the term itself is controversial. Quite naturally, patients resist the bizarre idea that they are somehow the cause of their own suffering.[8] How could it be that a pain spreading across the lower back like a firestorm does not reveal a steady stream of nociceptive impulses flowing from an injury to the lower back?

Although the concept of psychogenic pain normally implies that there is no identifiable organic cause, two eminent doctors remind their colleagues that psychogenic pain commonly expresses itself as "an elaboration" of pain already arising from tissue damage.[9] Perhaps an injury has healed, but the pain—for reasons unknown—simply refuses to stop, as if the brain had encoded it in a neural circuit that, once started, cannot be shut off. For Descartes, who provided one of the earliest descriptions, phantom limbs showed conclusively that pain could not be located "in" the body but only in the mind or soul.[10] Is it so hard to imagine that the same brain capable of turning the face blush-red at an indecent joke—the same brain that creates not only its own opioid analgesic but also the infinitely more bewildering product known as human thought—might on occasion fill the hand or foot or lower back with pain?

Perhaps the best way to deal with the difficult problems implied in the concept of psychogenic pain is to imagine a continuum. At one extreme we can locate the acute pain from a stubbed toe. Here the process of pain occurs almost too fast for thought; we need a conscious mind in order to perceive the injury, but otherwise the event belongs to the automatic and unthinking life of the body. Ideally, after a few minutes, the pain stops. At the other end of the continuum we can place the extreme variety of chronic pain called psychogenic. As in the couvade syndrome experienced

by expectant fathers, which we will meet later, this pain generated or sustained by the mind needs the body mainly in order to give suffering a location. Once the pain begins it may continue potentially without end.

It is important to observe that neither extreme end of this continuum manages a complete separation of body and mind. Even though the source of each pain seems entirely distinct, as if they came from different countries, chronic psychogenic pain clearly requires a body (if only a phantom body) to give it a home, just as the acute pain of a simple stubbed toe cannot register its protest without a perceiving mind. What is true at the extreme ends of the continuum holds even more clearly and forcefully in the middle range. The carpenter who slips from a high roof and lands on his toolbox will suffer major injuries, but the pain may also enfold deep anxieties about whether he will ever again work, support his family, and lead a normal life. The real-time experience of pain always falls somewhere along a line where body and mind engage each other in an unending collaboration. We dream or sleepwalk in a nonconscious state, but nonconscious pain is a contradiction in terms.

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All pain—especially all chronic pain—is an interdependent, inseparable, multidimensional union of the two elemental human forces that the Greeks called *psyche* (mind) and *soma* (body). The invisible interdependence of mind and body in the experience of pain is nowhere clearer than in a forgotten episode from American obstetrics known as "twilight sleep."[11] The name refers to a semiconscious state induced by a mixture of the drugs scopolamine and morphine. This combination, developed at the end of the nineteenth century in Germany, showed great promise in permitting safer childbirth. Safety, however, was only part of its public appeal. The combination of scopolamine and morphine blended an amnesiac with a narcotic, and it would take a philosopher to unravel the results fully. That is, the women who delivered their babies in a state of twilight sleep did not *remember* experiencing pain. As far as they were concerned, the experience had been absolutely painless.

Twilight sleep was quickly hailed, in the words of Dr. Bertha Van Hoosen, one of its foremost American medical advocates, as "the greatest boon the Twentieth Century could give to women."[12] Women were quick to celebrate its benefits. Most births at the end of the nineteenth century



took place at home, attended by midwives or, less frequently, by a general practitioner. The modern specialty of obstetrics did not exist. Although to relieve pain women sometimes received the dubious benefit of opium, chloroform, chloral, cocaine, quinine, ergot, or nitrous oxide, effective anesthesia in the hands of competent experts had not yet arrived. Outside the hospital setting most doctors preferred not to meddle with tricky gases or drugs. Midwives worked without them. In the grip of labor, women were mostly on their own.

Anxiety is well known to increase pain, and women had good reason to be anxious when it came time to deliver. In 1924 George Clark Mosher reported that there had been over 16,000 maternity-related deaths per year for the past twenty years. About the time of World War I, for every 164 live deliveries one woman died in childbirth.[13] U.S. government statistics for 1915 show that this figure represents almost *half* of all female deaths.[14] In short, childbirth was the number one killer of young women, and most young women faced childbirth numerous times. The odds of surviving four or five deliveries were probably much worse than the chances of returning alive from combat. Reluctant doctors, who had doubts about scopolamine, who resisted change, or who believed (on biblical authority) that God intended labor to be painful, soon found themselves under pressure and even under attack from women determined to gain access to an anesthetic that promised to make childbirth both safer and free from pain.

There was only one small wrinkle that kept twilight sleep from achieving universal acclaim. Although women insisted that their deliveries had been painless, the screams from the delivery room at times resembled a grade-B horror film. According to one observer, the patient "gives every outward evidence during her confinement of acute suffering. She cries out as others do under suffering; tells the doctor perhaps that her pains are severe beyond endurance."[15] In Chicago, Dr. Van Hoosen invented a special crib for confining women during twilight sleep so that they would not injure themselves by thrashing and turning. The physicians had every right to assume, from the cries and struggles, that the woman in delivery was suffering something like the torments of the damned.

In her book *Scopolamine-Morphine Anaesthesia* (1915), Dr. Van Hoosen provides this remarkable transcript of an operation that took place with the patient in a state of twilight sleep. The patient was a woman aged sixty-three:

11:20 A.M. (Pulse 120.) First operation begins.

11:21 A.M. "Oh, dear me (mumbles). (Patient cringes with expectation of pain.) Yes, he comes. Oh, dear me. Please let me go. I can't stand that." (Moans.) "Oh, oh, my Lord."

11:25 A.M. "Oh, my! that hurts so." (Curettage.) "Oh, people, I never imagined—Oh, dear."

11:30 A.M. Operation finished.

11:30 A.M. Doctor V. H.: "How do you feel?" Patient: "Lovely."[16]

This exchange was followed by complete amnesia. After three days the woman still remembered nothing of the operation.

The public interest in scopolamine-morphine anesthesia grew so powerful that women who delivered under twilight sleep became celebrities and street-corner orators. Indeed, between 1914 and 1915 the number of women who testified to the wonders of twilight sleep swelled into the thousands. In refuting claims that scopolamine-morphine deliveries were dangerous to babies, Mrs. Francis Xavier Carmody of Brooklyn, one of the best-known leaders of the new movement promoting scopolamine-morphine anesthesia, took the unusual step of displaying her robust infant publicly at Gimbels Department Store. Her personal account was simple but disarmingly persuasive: "I experienced absolutely no pain."[17]

The twilight-sleep movement, which had thrived on publicity, crashed suddenly when in 1915 Mrs. Carmody died in childbirth. Twilight sleep, as her doctor testified, was not the cause of death, but the public clearly had its doubts, and the movement was irreparably damaged. Soon better anesthesia was available that avoided delivery-room screams and did not require confining cribs, so the episode passed from thought. It remains, however, like the use of hypnosis to block or to relieve pain, a fruitful subject for meditation. What can we say about a pain that somehow imprints its unmistakable signs upon the body—wild thrashings, contortions, moans, and cries—yet leaves absolutely no trace within the mind? Is pain we cannot remember still pain? Twilight sleep, however we respond to such questions, offers strong evidence that pain comes into existence only at the moment when it makes its way into our consciousness. Without the mind's contribution, there is no pain.

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Our Western ideas of mind originate in ancient Greek and Roman philosophy. The Greek and Roman philosophers, as no doubt befits their



sun-drenched climates, had far less to say about pain than about pleasure.[18] In these slave-owning, aristocratic cultures, pain belonged almost by default to the lower classes. Pleasure, by contrast, not only suited aristocratic temperaments but also supplied a topic full of troubling questions for thinkers searching for the "highest good." Was pleasure consistent with the good? antithetical? inseparable? Plato and Aristotle, for example, both devote extended discussions to the role of pleasure in a good life, and the philosophical sect known as hedonists unashamedly proposed pleasure as the *summum bonum*. Pain simply did not evoke such rich philosophical talk. Mostly, it was just something to be avoided.

It is with Marcus Aurelius and the Stoic philosophers that pain makes its way openly into Greco-Roman thought. Marcus Aurelius is a figure of great importance and paradox: the emperor who ruled Rome from 161 to 180, a period often taken to constitute the Golden Age of Roman imperialism. Rome in this Golden Age, however, had also turned into a supermarket of competing philosophies, religions, gods, quacks, and soothsayers, including the relatively new sect called Christians, and, in this confused time, the most powerful man in the Western world not only turned his hand to philosophy but also based his meditations on the thought of a former Greek slave, Epictetus, who had spent his life in ill health, lame, living in an unlocked house said to contain nothing except a pallet and a rush mat. From their opposite stations, Epictetus and Marcus Aurelius both came to see pain as always under the dominion of the mind.

With its bloody circus maximus and succession of short, violent reigns, the Roman empire had no lack of pain to go around, and the school of Stoic philosophy (to which both Epictetus and Marcus Aurelius belonged) came to see the wise man's relationship to pain as a crucial issue. Historians distinguish between the early Stoics and later Stoics, but for our purposes we can consider Stoicism a fairly unified body of thought that promised its adherents, when they attained the rare state of wisdom, a complete freedom from anxiety, dread, and evil. Freedom was not an idle metaphor or abstract idea to the former slave Epictetus. He held that we are all enslaved to the extent that we give up control over our lives. Such control, for Epictetus, came only from the will. He taught that by a supreme act of will we must in effect expel from our minds every possible distraction from what he repeatedly calls "the sphere of the moral purpose."[19]

Moral purpose for Epictetus did not refer to morality or rules of good behavior. The serene Stoic wise man, in fixing his thoughts on the sphere of the moral purpose, lived a life strictly according to reason, which for Stoics required a constant and utter contempt for the (irrational) passions. Only through the willed conquest of fear and passion, according to Epictetus, do we fully live out the inner truth of our own being. Only then are we truly free. Pain, of course, ranks among the most common sources of fear. Thus wisdom and moral purpose for Epictetus required that the individual should attain an absolute willed conquest over pain. This conquest did not depend on advances in Roman medicine. It was something the Stoic philosopher accomplished for himself.

Marcus Aurelius differs significantly from Epictetus in his darker tone and more somber images, as when he compares human life to a warfare and a sojourn in a strange land, but he picks up unchanged from Epictetus the conviction that pain represents a life of slavery.[20] Pain becomes both sign and source of our loss of freedom and of our falling away from wisdom. His strategy for opposing pain, in what amounts to an anticipation of modern medicine, is to regard it as entirely a phenomenon of the body. He views the body, with its diseases and passions, as continuously seeking to enslave us to its needs. The Stoic's willed conquest over pain thus entails an absolute victory of mind and will over body. Once we affirm the dominance of mind over body, pain for Marcus Aurelius confronts us with a simple, rational alternative: "If it is past bearing, it makes an end of us; if it lasts, it can be borne. The mind, holding itself aloof from the body, retains its calm, and the master-reason remains unaffected. As for the parts injured by the pain," he concludes contemptuously, "let them, if they can, declare their own grief."[21]

The disdain with which this pagan philosopher speaks of the body sounds like the severer excesses of medieval theology. (Marcus Aurelius cites approvingly, for example, the description of man composed by his master Epictetus: "A poor soul burdened with a corpse.")[22] Small wonder that the early Christians found this brand of Stoicism highly amenable to a system of thought that divided human beings into a perishable body and an immutable soul. The choice for Marcus Aurelius is clear:

> Pain must be an evil either to the body—in which case let the body speak for itself—or if not, to the soul. But the soul can always refuse to consider it an evil, and so keep its skies unclouded and its calm unruffled. For there is no decision, no impulse, no movement of approach or recoil, but must proceed from within the self; and into this self no evil can force its way.[23]



Marcus Aurelius implicitly assumes here—as he explicitly states elsewhere—that the mind or soul attains true freedom only when retired to its own inwardness, untouched by the things of the world. The ultimate victory of soul over body thus finds its characteristic expression for Stoic philosophy in the triumph over pain.

Stoics, of course, sometimes found it difficult to live up to such an austere creed. Ancient literature records numerous moments of backsliding. Cicero in his *Tusculan Disputations* (II.xxv) writes that Dionysus of Herakleon, who learned his Stoicism from its founder, Zeno, suffered such agony in his kidneys that he was forced to cry out and confess how falsely he had understood pain. Even Marcus Aurelius unbends a bit. "When in pain," he writes, "always be prompt to remind yourself that there is nothing shameful about it and nothing prejudicial to the mind at the helm, which suffers no injury."[24] Stoicism did not teach that the mind's power over pain was easy to achieve, only that it was necessary. Yet this ideal gave special importance to aspects of life we might well take for granted. On his deathbed Marcus Aurelius deliberately recalled the pleasures of a philosophical friendship as a means of combatting a pain so terrible that he surely must have wondered whether mind possessed all the powers he had claimed.

The Stoic split between body and mind, like the Christian split between body and soul, indicates how ancient the desire is to assign pain wholly to the flesh. What makes Stoicism so germane to my argument, however, is the importance it assigns to mind. For Stoics such as Marcus Aurelius, the mind and will entirely reshape the experience of pain. Stoic writers were fond of describing philosophy as a medicine: a practical aid in the affairs of daily living. Like a medicine, the mind for the Stoic philosopher in effect uncreates or recreates the body's pain. The bodily pain of Stoicism, we might say, is paradoxically always in the head because the mind or reason or soul always possesses the power—as well as the duty—to erase or to overcome it.

No doubt today Stoicism seems too austere and remote to offer a credible medicine or philosophy for managing pain, although Freud used a variant of Stoic thinking when he described his cancer of the jaw as a "small island of pain in a sea of indifference." Yet Stoicism certainly sug-

gests that the mind has powers over pain we have not sufficiently understood. We need not travel to ancient Rome, however, to encounter a philosophical medicine willing to recognize and to utilize the mind's crucial role in the experience of chronic pain. We might equally pay a brief visit to the pain center of Dr. Benjamin Crue in Durango, Colorado.

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Durango is a small, raw, Western town surrounded by mountains with strangely sawed-off, flat tops. The low buildings constructed out of orange-yellow brick give the impression that utility is prized here. It was originally a mining town, founded in 1880 by the Denver and Rio Grande Railroad, a no-nonsense place for ore and shipping. Yet beauty is all around: in the ancient stands of spruce, pine, and aspen dug into rock and crags, in the meadows that suddenly interrupt acres of dense woods. Half a millennium ago in the canyons of nearby Mesa Verde the mysterious Anasazi Indians ("the old ones") carved miniature stone cities high into the walls of overhanging cliffs. It is not where you would expect to encounter one of the world's finest specialists in chronic pain.

Dr. Benjamin L. Crue, Jr.—a rugged and gentle man in his sixties—seems at home both in the serene mountains around Durango and in the gritty, working-class town. This is surprising only because he spent most of his professional life in the affluent suburbs of Los Angeles where in 1960 he founded and directed one of the first multidisciplinary centers for the treatment of pain: the New Hope Pain Center. He is a distinguished neurosurgeon with a long train of publications and has specialized in chronic pain for the past thirty years. Among his many posts he has served as president of the American Pain Society and president of the American Academy of Algologists. Crue's approach to chronic pain was not just innovative. Within the world of medical thought and practice in place when he left medical school, it went profoundly against the grain.

Normal science has been described, in an influential book by Thomas Kuhn, as mostly a mopping-up exercise.[25] Kuhn means that during most periods and in most fields there is an accepted theoretical framework of scientific thought—a paradigm, as he calls it—that commands general acceptance, and scientists normally work on small, still unexplained problems (known as "puzzles") that explore and fill out and confirm the prevailing paradigm. When, fresh out of medical school, Benjamin Crue first began working on the specialized problem of facial pain called tic douloureux, the scientific paradigm that had prevailed for more than a century explained pain as a transmission of nerve impulses from the site of damage (the periphery) to the brain. In order to stop the pain, medicine, logically, set out to interrupt the transmission of pain impulses from the periphery. Anesthesiologists learned how to block specific nerves with chemical compounds. Neurosurgeons developed an array of exact operations with ominous names such as rhizotomy, cordotomy, and sympathectomy designed to cut the normal pain pathways. As an unsolved problem, tic douloureux offered a perfect opportunity for mopping up.

Crue discovered that in the case of tic douloureux the accepted paradigm was not working exactly right. Most of the time neurosurgeons could indeed stop the tic pain by blocking it at the periphery. The paradox was that, in a small percentage of cases, cutting the peripheral nerves or blocking them with alcohol did not stop the pain. None of the standard neurosurgical procedures provided lasting relief. It was this paradoxical exception to the rule that suggested something else must be going on. At last the moment of truth arrived. Crue finally decided that the pain of tic douloureux could not be fully explained through the accepted paradigm. Worse, it called the paradigm itself into question. Tic pain, Crue deduced, must not originate at the periphery but rather in the brain. Thus you could not always block the pain of tic douloureux at the periphery because it was always already in the head. This theory, since it opposed the accepted paradigm learned by all doctors in medical school, met with the fate of most new claims: instant disbelief.

There was more disbelief to come, however. In what he calls a "lyric leap," Crue soon recognized that many forms of intractable pain followed the pattern he proposed for tic douloureux. Not all forms. He recognized that cancer patients, for example, required a separate team of specialists, since their pain originated in specific tumors. Like cancer pain, what Crue called "recurrent acute pain"—such as the pain of arthritis—clearly had its origin in specific forms of peripheral tissue damage. Beyond these clear exceptions, however, Crue still confronted a large and growing population of patients whose pain could not be traced to a continuing, identifiable organic source. Crue described this specific, paradoxical illness as "benign chronic intractable pain syndrome" (BCIPS). The ultimate source of benign chronic pain syndrome, Crue decided, was not peripheral but central.

This new way of thinking about pain—while not so vast in its impli-

cations as the paradigm changes discussed by Kuhn—was revolutionary and explosive. In claiming a central origin, Crue absolutely did *not* mean that chronic pain was imagined or unreal or merely "mental." Indeed, he emphasized that most chronic pain started with an organic, peripheral injury. This pain, however, continued to persist long after the original lesion or injury had healed and thus transformed itself into a chronic condition that was entirely central and directed by the brain. Herein lay the bombshell. If much chronic pain was truly central rather than peripheral, it obviously required new methods of treatment and new avenues of research. Well-fortified boundaries would have to be crossed. For example, neurosurgeon Crue soon found he needed to hire a psychologist and later a psychiatrist and finally a full multidisciplinary team of specialists, including a neurologist, anesthesiologist, biofeedback technician, occupational therapist, neurophysiologist, dietician, and orthopedist.[26]

A polite, undeclared war broke out. A chronic pain that was central would not require the nerve blocks and operations so often prescribed to cut the peripheral pathways. (As it turned out, anterolateral cordotomies proved effective in only half the patients, often for just a short time, and almost 15 percent of patients suffered worse pain after the operation.)[27] Crue does not hesitate to blame his fellow physicians for clinging to an outworn peripheralist model that leads to useless, expensive, invasive mistreatment of patients with chronic pain. As he writes:

> The overwhelming majority of patients we see with chronic intractable benign pain syndromes have had both their pain syndrome and their pain behavior iatrogenically reinforced over and over again. Many of them have been subjected to mutilating operative procedures, where the only reasonable expectation was, quite frankly, the placebo effect. . . . It is time that neurosurgeons, orthopedists, and anesthesiologists admit that with very few rare exceptions they are bankrupt when it comes to treating chronic intractable benign pain syndrome patients.[28]

Iatrogenic illness—to cite the worst euphemism in medical terminology—means illness caused by the physician (*iatros* in Greek). Understandably, Crue found himself at odds with powerful figures in the newly emerging specialty of pain treatment.

The two camps in this conflict of interpretations Crue has called the centralists and the peripheralists. In fact, he remembers first hearing the name "centralist" spoken dismissively by Dr. John J. Bonica, founder of the pioneering pain clinic at the University of Washington and the man



almost universally regarded as the father of the pain clinic movement. Bonica was chairman of the Department of Anesthesiology and a proponent of various nerve blocks and surgical interventions designed to cut the pain pathways from the periphery. When Bonica at a meeting referred to "Crue and his group of centralists," the name sounded so right to Crue that he decided to ignore its apparently dismissive status. The lines were drawn. If Crue was a centralist, that made Bonica a peripheralist. He saw no middle ground.

The centralist and peripheralist models of chronic pain are absolutely distinct. The peripheralist model assumes that pain results from tissue damage and from continued "afferent nociceptive input." The centralist model rejects the need for any continued impulse from the periphery. It posits "a central generator mechanism" responsible for keeping the pain alive.[29] For a time, the conflict between centralist and peripheralist schools was red hot. Neither side would publish in the journals of the other side. Now the atmosphere seems more like an uneasy truce or compromise. Many specialists seem willing to grant that at least a few forms of chronic pain probably have an underlying central mechanism, just as patients with recurrent acute pain from underlying chronic pathologies (such as arthritis) may have long-lasting distress that results from a combination of peripheral and central causes. Crue points out that physicians already recognize comparatively rare pain syndromes that originate entirely within the central nervous system, as sometimes happens after a stroke.[30] But Crue goes far beyond the compromisers in asserting that a great deal of chronic pain—what he calls the benign chronic intractable pain syndrome—exists in the absence of a continuing, peripheral source of nociceptive input. The back or leg hurts now—whatever its original source of injury—simply because the central nervous system (and specifically the brain) tells it to.

Crue is unyielding in his conviction. "The centralist concept of pain is correct," he writes, "and the peripheralists are incorrect."[31] We will see, in the final chapter, that new research has uncovered in the brain a previously unknown pain-*enhancing* system of so-called "on-cells" that may well provide support for the centralist position. Crue meanwhile argues that most doctors remain dogged peripheralists, in part because medical schools for over a century have taught nothing else. Further, he would not agree that the conflict between centralists and peripheralists is subsiding

into compromise or tacit agreement, even though some influential figures would like us to think so. It is, he contends, a still simmering and unresolved controversy. As a realist he recognizes that the public finds it hard or impossible to believe that their pain does not require a continuing peripheral, organic cause. "This certainly is not immediately acceptable to a majority of patients with chronic pain," Crue writes, adding with a jab at his colleagues, "and it seems not even conceivable to a majority of physicians."[32] We all secretly prefer the old Homeric notion of pain as the intrusion of an outside force: the arrows of the gods. Could it be that our brain alone really spins out a cycle of chronic suffering, like an endlessly replaying tape, with no continuing injury needed to keep it going?

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"It was my desire to find out more about human brain function in relation to the problem of free will," writes Benjamin Crue, "that led me into neurophysiology; then, during World War II, into neurosurgery." He wanted to know whether a knowledge of brain functions can support our normal belief—with its profound implications for thinking about good and evil—that "all things being equal, we could have done otherwise." Do we make truly free choices when we comfort the sick or rob a 7-Eleven store? Crue frankly confesses his failure to find a "scientifically acceptable hypothesis" to support his belief in free will.[33] Yet the desire of traditional medicine to flee such philosophical and theological questions may be precisely what limits many physicians in their understanding of chronic pain.

It took courage for Viktor E. Frankl to address the medical-scientific community in a text bearing the clearly unacceptable title *The Doctor and the Soul* (1955). Yet Frankl's courage is already well known to the several million readers of *Man's Search for Meaning* (1946).[34] In this brief book Frankl discusses both his approach to therapy and his experience as a prisoner in Nazi death camps. Although he afterward served as Professor of Psychiatry and Neurology at the University of Vienna Medical School, as head of the Department of Neurology at the Poliklinik Hospital in Vienna, and as president of the Austrian Medical Society of Psychotherapy, he is remembered among nonmedical readers as the man who survived for some three years the living hell of Auschwitz and Dachau.

The new explosion of interest in the Holocaust has not paid much attention to Frankl, which is unfortunate considering his importance in the postwar period. *Man's Search for Meaning*—which he had originally published under the title *From Death-Camp to Existentialism*—is not simply a personal memoir but a physician's cold-eyed calculation of what it costs to survive amid inhuman circumstances. "We who have come back," writes Frankl, "by the aid of many lucky chances or miracles—whatever one may choose to call them—we know: the best of us did not return."[35] This is not modesty. The best who did not return, in Frankl's words, were prisoners who sacrificed their lives so that other prisoners might live even a few days longer. The account that Frankl writes of his experience holds a unique place among narratives of the Holocaust because he writes both as a survivor and as a psychologist concerned with the question of what it was, beyond luck or miracle, that allowed some prisoners to survive scenes of unthinkable brutality.

Frankl believes he survived at least in part because, at a critical moment, when he felt absolutely overwhelmed by exhaustion, pain, and despair, he found a meaning that allowed him to go on. He suddenly imagined himself behind a lectern speaking to a large audience on the psychology of the concentration camps. Amid the wreckage of European civilization, this almost crazed vision of civilized, scientific inquiry recommencing its normal work in the aftermath of unprecedented disaster gave him a reason not to give in to his despair. It also provided an individual instance of the general principle he saw at work in the death camps and in the world beyond. For Frankl, the crucial key to survival—even in the face of an intolerable abyss of suffering—lies in our power to discover or to attribute a meaning to our existence.

Meaning—a term he leaves undefined and open to the varieties of human usage—is the key to Frankl's account of his protracted experience with pain. We perhaps lend his experience a false melodrama if we think of his pain through cinematic depictions of Nazi torture. Pain also belonged to the less graphic but backbreaking daily misery of the camps. For three years Frankl spent his days at unrelenting hard labor, in semi-starvation, under conditions so extreme that prisoners regularly collapsed and died, broken down from illness, exhaustion, and sometimes hourly beatings. Pain was not a sudden intruder but the medium in which he lived almost every minute of his three-year confinement.

Here is a fragment of Frankl's description of the ten-hour days he spent working at road repair in freezing temperatures without gloves—his only meal a thin, watery soup:

Like nearly all the camp inmates I was suffering from edema. My legs were so swollen and the skin on them so tightly stretched that I could scarcely bend my knees. I had to leave my shoes unlaced in order to make them fit my swollen feet. There would not have been space for socks even if I had had any. So my partly bare feet were always wet and my shoes always full of snow. This, of course, caused frostbite and chilblains. Every single step became real torture. Clumps of ice formed on our shoes during our marches over snow-covered fields. Over and again men slipped and those following behind stumbled on top of them. Then the column would stop for a moment, but not for long. One of the guards soon took action and worked over the men with the butt of his rifle to make them get up quickly.[36]

Even worse, according to Frankl, was the added agony of bearing insult, humiliation, and day-by-day injustice. It is hard to imagine a more intimate acquaintance with pain.

Frankl found himself living in a political version of the irrational universe that postwar existential philosophy came to describe as absurd: stripped of his identity, reduced to a number, denied his basic human dignity and rights, confined in a senseless routine, brutalized and tyrannized. Kafka invented nothing more terrifying than what Frankl faced every day. Yet this personal encounter with pain was for Frankl not a confirmation of existential nothingness. It was a turning point. The challenge he faced was to find a personal meaning in an apparently meaningless and inhuman existence. "Woe to him who saw no more sense in his life," he writes of his comrades in the camps, "no aim, no purpose, and therefore no point in carrying on. He was soon lost."[37]

Two crucial points need clarification before we return to Frankl's personal search for meaning amid the carnage and suffering of the concentration camp. First, meaning for Frankl is always plural and personal: there is no single, universal fountain of purpose. The meanings we discover in our lives will differ from person to person. The meanings an individual creates or discovers may differ from situation to situation, or simply change as we grow older. Frankl never tires of repeating that meaning must be discovered, not given, and he emphasizes that searching is more important than discovering. You may never find what you are searching for. Yet—on this point Frankl is adamant—if you block or deny the *search* for meaning, you ultimately annihilate the will to live.

The second point to clarify is this: the drive for meaning depends ultimately on our irreducible freedom of will. Frankl admits, readily, that



we are never entirely free; social and biological limitations always constrain us. Yet he believes that no social system or biological constraint—from tyranny to death—is so powerful that it can overrule our freedom to take a stand: to choose at least our *attitude* toward pain. This emphasis on individual freedom of choice certainly links Frankl with a major theme of existential philosophy. (One of his many books is entitled *Psychotherapy and Existentialism*.) There is nothing abstract or abstruse, however, about his treatment of individual freedom. Even in the Nazi camps, Frankl believes, he still possessed the personal freedom to choose what gives his life—and his pain—its meaning.

Pain constitutes a major test for the mode of treatment called logotherapy that Frankl developed after his release from Dachau. He recognizes that we will avoid pain as long as avoidance is in our power.[38] But what about pain that we cannot avoid? This question returned to Frankl with particular urgency when he encountered patients who were terminally ill. When analgesics failed and cure was past hope, pain was then simply unavoidable. It faced such patients as a brute, existential fact, like the massive rock Sisyphus was doomed to push endlessly uphill. In fact, it was the unavoidable pain they faced—far more than the prospect of death—that seemed to plunge his patients into deepening despair.

Frankl's response to such hopeless pain came again from his experience in the death camps. There he discovered that meaning consists not only in statements but also in actions. It consists not only in asking questions or in seeking answers but in being questioned. "We needed to stop asking about the meaning of life," he writes of especially difficult moments in the camps, "and instead to think of ourselves as those who were being questioned by life—daily and hourly. Our answer must consist, not in talk and meditation, but in right action and right conduct. Life ultimately means taking the responsibility to find the right answer to its problems and fulfilling the tasks which it sets for each individual."[39]

The response to the question of unavoidable pain, for Frankl, is less a statement (a correct answer put into words) than a deed: suffering transformed from submission or defeat into right action. The phrase "right action" of course does not imply either moral behavior (Frankl freely confesses that he stole food in the camps) or a single, universally proper response applicable to everyone. It implies instead that crisis will ultimately confront us with the necessity to act, and our action, if it is right, will

express the deepest level of our beliefs, beliefs we may not even know we hold or be able to put into words. In effect, Frankl discovered that his own protracted questioning by life brought him to understand his suffering as a task he was called upon to perform, well or poorly.

There is doubtless a strain or contradiction in Frankl's thought when he proceeds from personal experience to psychotherapy. He can never quite resist the temptation to make his own answer (that suffering is a task) universal. His language certainly embraces more than a strictly secular or medical point of view when he talks about the task of suffering as "taking up your cross." Perhaps he simply found in Christian tradition a metaphor consistent with his view that suffering, when understood as a task, holds out the possibility for redeeming a wasteland of meaninglessness pain. As he writes in this universalizing spirit:

> When a man finds that it is his destiny to suffer, he will have to accept his suffering as his task; his single and unique task. He will have to acknowledge the fact that even in suffering he is unique and alone in the universe. No one can relieve him of his suffering or suffer in his place. His unique opportunity lies in the way in which he bears his burden.[40]

The vision of humankind as a solitary figure suffering in an empty landscape bears less resemblance to traditional Christian doctrine or to the Book of Job than to the plot of Beckett's existential classic *Waiting For Godot* (1952). Yet the difference is evident. Beckett's characters wait with no clear and articulate sense that pointless waiting might itself constitute their self-appointed task: might give a personally redemptive meaning to their meaningless pain. "If there is a meaning in life at all," Frankl writes, "then there must be a meaning in suffering."[41]

Frankl is a popular and moving speaker, and once he was asked to address the prisoners in San Quentin. There he encountered the same attentive audience that, in a now legendary performance, had understood almost instinctively the bleak avant-garde humor of *Waiting For Godot*. At the conclusion of his talk, an inmate asked Frankl to say a few words, publicly, over a speaker system, to a prisoner on death row who faced the gas chamber in four days. At Auschwitz Frankl too had lived in daily contact with the gas chamber. He told the condemned prisoner that man always holds the power to rise above himself, even in the last minute, and "by so doing retroactively invest meaning even in a wasted life."[42] Then he recounted for the prisoner Tolstoy's story about the death of Ivan Ilych.



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Frankl's experience drew him into an unusual relationship with his patients. He wrote without embarrassment about what he called a "medical ministry," by which he meant that physicians cannot serve as mere technicians of the body but must also risk entering into the emotional and spiritual lives of their patients. Only by daring to cross such boundaries can the physician, in Frankl's view, attain maximum insight and thus offer maximum assistance. Today, of course, hospitals neatly divide the work of physician and chaplain into separate offices, as if needing a clear, bureaucratic structure to mark off the boundary between body and spirit. Yet this separation, maintained in the name of science, did not seem inevitable to the man often regarded as a father of the scientific revolution. Francis Bacon wrote in 1605:

> I esteem it . . . to be clearly the office of a physician not only to restore health, but also to mitigate the pains and torments of diseases; and not only when such mitigation of pain, as of a dangerous symptom, helps and conduces to recovery; but also when, all hope of recovery being gone, it serves only to make a fair and easy passage from life.[43]

Modern doctors and patients who know little about chronic pain—and little about the mind's power to increase or to decrease the torment we experience—would do well to ponder Bacon's words and the life of Viktor Frankl.