

(45) congregation.

What is happening, psychologically and neurologically, when a tune or a jingle takes possession of one like this? What are the characteristics that make a tune or a song “dangerous” or “infectious” in this way? Is it some oddity of sound, of timbre or rhythm or melody? Is it repetition? Or is it arousal of special

(50) emotional resonances or associations?

My own earliest brainworms can be reactivated by the act of thinking about them, even though they go back more than sixty years. Many of them seemed to have a very distinctive musical shape, a tonal or melodic oddness that may have played a part in imprinting them on my mind. And they had meaning and emotion, too, for they were usually Jewish songs and litanies associated with a sense of heritage and history, a feeling of family warmth and togetherness. One favorite song, sung after the meal on Seder nights was “Had Gadya” (Aramaic for “one little goat”). This was an accumulating and repetitive song, and one that must have been sung (in its Hebrew version) many times in our Orthodox household. The additions, which became longer and longer with each verse, were sung with a mournful emphasis ending with a plaintive fourth. This little phrase of six notes in a minor key would be sung (I counted!) forty-six times in the course of the song, and this repetition hammered it into my head. It would haunt me and pop into my mind dozens of times a day throughout the eight days of Passover, then slowly diminish until the next year. Did the qualities of repetition and simplicity or that odd, incongruous fourth perhaps act as neural facilitators, setting up a circuit (for it felt like this) that reexcited itself automatically? Or did the grim humor of the song or its solemn, liturgical context play a significant part, too?

(70) Yet it seems to make little difference whether catchy songs have lyrics or not—the wordless themes of *Mission: Impossible* or Beethoven’s Fifth can be just as irresistible as an advertising jingle in which the words are almost inseparable from the music (as in Alka-Seltzer’s “Plop, plop, fizz, fizz” or Kit Kat’s “Gimme a break, gimme a break”).

(75) For those with certain neurological conditions, brainworms or allied phenomena—the echoic or automatic or compulsive repetition of tones or words—may take on additional force. Rose R., one of the post-encephalitic parkinsonian patients I described in *Awakenings*, told me how during her frozen states she had often been “confined,” as she put it, in “a musical paddock” – seven pairs of notes (the fourteen notes of “Povero Rigoletto”) which would repeat themselves irresistibly in her mind. She also spoke of these forming “a musical quadrangle” whose four sides she would have to perambulate, mentally, endlessly. This might go on for hours on end, and did so at intervals throughout the entire forty-three years of her illness, prior to her being “awakened” by L-dopa.

(85) The phenomenon of brainworms seems similar, too, to the way in which people with autism or Tourette’s syndrome or obsessive-compulsive disorder may become hooked by a sound or a word or a noise and repeat it, or echo it, aloud or to themselves, for weeks at a time. This was very striking with Carl Bennett, the surgeon with Tourette’s syndrome whom I described in *An Anthropologist on Mars*. “One cannot always find sense in these words,” he said. “Often it is just the sound that attracts me. Any odd sound, any odd name, may start repeating itself, get me going. I get hung up with a word for two or three months. Then, one morning, it’s gone, and there’s another one in its place.” But while the involuntary repetition of movements, sounds, or words tends to occur in people with Tourette’s or OCD or damage to the frontal lobes of the brain, the automatic or compulsive internal repetition of musical phrases is almost universal—the clearest sign of the overwhelming, and at times helpless, sensitivity of our brains to music.

(100) There may be a continuum here between the pathological and the normal,