

for while brainworms may appear suddenly, full-blown, taking instant and entire possession of one, they may also develop by a sort of contraction, from previously normal musical imagery. I have lately been enjoying mental replays of Beethoven's Third and Fourth Piano Concertos, as recorded by Leon Fleisher (105) in the 1960s. These "replays" tend to last ten or fifteen minutes and to consist of entire movements. They come, unbidden but always welcome, two or three times a day. But on one very tense and insomniac night, they changed character, so that I heard only a single rapid run on the piano (near the beginning of the Third Piano Concerto), lasting ten or fifteen seconds and repeated hundreds of (110) times. It was as if the music was now trapped in a sort of loop, a tight neural circuit from which it could not escape. Towards morning, mercifully, the looping ceased, and I was able to enjoy entire movements once again.

Brainworms are usually stereotyped and invariant in character. They tend to have a certain life expectancy, going full blast for hours or days and then dying (115) away, apart from occasional afterspurts. But even when they have apparently faded, they tend to lie in wait; a heightened sensitivity remains, so that a noise, an association, a reference to them is apt to set them off again, sometimes years later. And they are nearly always fragmentary. These are all qualities that epileptologists might find familiar, for they are strongly reminiscent of the (120) behavior of a small, sudden-onset seizure focus, erupting and convulsing, then subsiding, but always ready to re-ignite.

Some of my correspondents compare brainworms to visual afterimages, and as someone who is prone to both, I feel their similarity, too. (We are using "afterimage" in a special sense here, to denote a much more prolonged effect (125) than the fleeting afterimages we all have for a few seconds following, for instance, exposure to a bright light.) After reading EEGs intently for several hours, I may have to stop because I start seeing EEG squiggles all over the walls and ceiling. After driving all day, I may see fields and hedgerows and trees moving past me in a steady stream, keeping me awake at night. After a day on a (130) boat, I feel the rocking for hours after I am back on dry land. And astronauts, returning from a week spent in the near-zero-gravity conditions of space, need several days to regain their "earth legs" once again. All of these are simple sensory effects, persistent activations in low-level sensory systems, due to sensory over-stimulation. Brainworms, by contrast, are perceptual constructions, (135) created at a much higher level in the brain. And yet both reflect the fact that certain stimuli, from EEG lines to music to obsessive thoughts, can set off persistent activities in the brain.

There are attributes of musical imagery and musical memory that have no equivalents in the visual sphere, and this may cast light on the fundamentally (140) different way in which the brain treats music and vision. This peculiarity of music may arise in part because we have to construct a visual world for ourselves, and a selective and personal character therefore infuses our visual memories from the start—whereas we are given pieces of music already constructed. A visual or social scene can be constructed or reconstructed in a (145) hundred different ways, but the recall of a musical piece has to be close to the original. We do, of course, listen selectively, with differing interpretations and emotions, but the basic musical characteristics of a piece, its tempo, its rhythm, its melodic contours, even its timbre and pitch—tend to be preserved with remarkable accuracy.

It is this fidelity—this almost defenseless engraving of music on the brain—which plays a crucial part in predisposing us to certain excesses, or pathologies, (150) of musical imagery and memory, excesses that may even occur in relatively unmusical people.

There are, of course, inherent tendencies to repetition in music itself. Our (155) poetry, our ballads, or songs are full of repetition. Every piece of classical music has its repeat marks or variations on a theme, and our greatest composers are