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It Was 40 Years Ago Today

By Daniel J. Levitin
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Yes, it's been 40 years exactly since Sgt. Pepper, having labored the previous 20 years teaching his band to play, arranged for its debut in full psychedelic regalia. He leveraged a little help from his friends, notably the vocalist Billy Shears and a riverboat owner named Lucy who had apparently made her fortune in the diamond business. Pepper realized that good music-making requires the expanding of horizons. A recent "trip" inspired him to incorporate tabla and sitar into the music. The band exhorted us to sit back and let the evening go so that they could turn us on, musically, lyrically, and blow our minds for the next several decades.

It has been 45 years since Mitch Miller, head of A&R (artists and repertory) at Columbia Records, dismissed the Beatles as "the hula hoops of music." Will Beatles songs still be loved when baby boomers are 64? Will they inspire future generations? Or will their music die with those who became intoxicated by their wit and charisma during the mind-expanding '60s?

A hundred years from now, musicologists say, Beatles songs will be so well known that every child will learn them as nursery rhymes, and most people won't know who wrote them. They will have become sufficiently entrenched in popular culture that it will seem as if they've always existed, like "Oh! Susanna," "This Land Is Your Land" and "Frère Jacques."

Great songs seem as though they've always existed, that they weren't written by anyone. Figuring out why some songs and not others stick in our heads, and why we can enjoy certain songs across a lifetime, is the work not just of composers but also of psychologists and neuroscientists. Every culture has its own music, every music its own set of rules. Great songs activate deep-rooted neural networks in our brains that encode the rules and syntax of our culture's music. Through a lifetime of listening, we learn what is essentially a complex calculation of statistical probabilities (instantiated as neural firings) of what chord is likely to follow what chord and how melodies are formed.

Skillful composers play with these expectations, alternately meeting and violating them in interesting ways. In my laboratory, we've found that listening to a familiar song that you like activates the same parts of the brain as eating chocolate, having sex or taking cocaine. There really is a sex, drugs and rock and

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sex or taking opiates. There really is a sex, drugs and rock-and-roll part of the brain: a network of neural structures including the nucleus accumbens and the amygdala. But no one song does this for everyone, and musical taste is both variable and subjective.

Today the Beatles catalogue is loved cross-culturally -- the product of a six-year burst of creativity unparalleled in modern music. The Beatles incorporated classical elements into rock so seamlessly that it is easy to forget that string quartets and Bach-like countermelodies and bass lines (not to mention plagal cadences) did not always populate pop. Music changed more between 1963 and 1969 than it has in the 37 years since, with the Beatles among the architects of that change.

Paul McCartney may be the closest thing our generation has produced to Franz Schubert -- a master of melody, writing tunes anyone can sing, songs that seem to have been there all along. Most people don't realize that "Ave Maria" and "Serenade" were written by Schubert (or that his "Moment Musical in F" so resembles "Martha My Dear"). McCartney writes with similar universality. His "Yesterday" has been recorded by more musicians than any other song in history. Its stepwise melody is deceptively complex, drawing from outside the diatonic scale so smoothly that anyone can sing it, yet few theorists can agree on exactly what it is that McCartney has done.

The timelessness of such melodies was brought home to me by Les Boréades, a Quebec group that has recorded *Beatles* music on baroque instruments. The instruments give the sense that you're hearing Bach or Vivaldi, and for moments it's possible to forget that you're listening to Beatles songs. We're so used to hearing Beatles songs that for many of us they no longer hold any surprises. But when they're stripped of their '60s production and the personal and social associations we have with them, you can hear the intricate and beautiful interplay of rhythm, harmony and melody.

On the bus recently the radio played "And I Love Her," and a Portuguese immigrant about my grandmother's age sang along with her eyes closed. How many people can hum even two bars of Beethoven's Fourth Symphony, or Mozart's 30th? I recently played 60 seconds of these to an audience of 700 -- including many professional musicians -- but not one person recognized them. Then I played a fraction of the opening "aah" of "Eleanor Rigby" and the single guitar chord that opens "A Hard Day's Night" -- and virtually everyone shouted the names.

To a neuroscientist, the longevity of the Beatles can be explained by the fact that their music created subtle and rewarding schematic violations of popular musical forms, causing a symphony of neural firings from the cerebellum to the prefrontal cortex, joined by a chorus of the limbic system and an ostinato from the brainstem. To a musician, each hearing showcases nuances not heard before, details of arrangement and intricacy that reveal themselves across hundreds or thousands of performances and listenings. The act we've known for all these years is still in style, guaranteed to raise a smile, one hopes for generations to come. I have to admit, it's getting better all the time.

Daniel J. Levitin, a former record producer, is a professor of psychology and music at McGill University in Montreal and the author of "This Is Your Brain on Music: The Science of a Human

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