

Musicophilia

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Why is music so basic? Why is it so intimately connected to our emotions? Maybe emotions are indistinguishable from their musical manifestations? First there is music, then there are emotions? Sacks is a materialist when it comes to our mental capacities, maybe not so much out of temperament or as an ideological philosophical standpoint, as out of practical need being after all a practicing neurologist. As William James noted, there is nothing wrong with the notion of a 'Soul', except that it has no explanatory potential. James also starts out his 'Principles of Psychology' by noting what behavioral changes are connected with different kind of excisions of avian and amphibian brains. This is still a basic approach to the neurological workings of the brain, an approach I would like to call geographical. Different aspects of our neurology can be connected to different parts of the brain. Damage in certain areas manifesting themselves in specific ways. Of course the picture is somewhat complicated by the fact that many functions can reassert themselves in alternate locations, as if the working of the brain has an independent reality and a will of its own (maybe we should term that the 'soul', the metaphysical ambience of all neurological activity?). A too literal geographical approach would of course be absurd, that would be to ask where exactly in the algorithm for the sieving of the primes can we see that 65537 is a prime. The purpose of Sacks book is to explore the connection between the neurology of the brain and the phenomenon of music, something which not surprisingly has attracted a lot of attention and extensive research, without, as is normal in the case of neurology, to provide much illumination, except at rather trivial levels.

'Amusia' hardly an amusing condition, is supposedly a very rare condition. To the truly amusical, there is not only musical incompetence, which is far more common, but also a total emotional indifference. Music is experienced as so much meaningless noise. Sacks speculates whether the two brothers James were amusiacs, after all in the lengthy treaty of the elder brother, referred to above, there is almost no discussion of music; and also Henry James in his novels breaches no musical themes¹. Freud, too seems to be indifferent to music, or is that simply a case of rebellious resistance?

What are the elements of music? Rhythm and tone above everything, but also timbre, the latter being in the nature of combinations of tones and overtones specific to individual instruments, which allows us to distinguish not only between a flute and a piano, but

¹ On the other hand there is almost no 'sensuality' of any kind in the novels of Henry James, a fact that made him seem rather dry and bloodless to me when I first read him as a teenager; a verdict that I have had little reason to modify during a more recent re-encounter as an adult. Sure there is much subtlety and sophistication, to which I might have been blind to earlier, and surely he is a distinguished writer in the tradition of Jane Austen, but he presents almost no visual imagery and thus displays almost no sense of place in his fiction, everything seems to take place in a rather abstract realm, which incidentally, as David Lodge has remarked, makes him perfect for televised costume drama adaptations.

within different kinds of wind and string instruments² In fact the real connoisseur, like the expert sommelier, maybe able to distinguish between different individual instruments. Of the two, rhythm seems more basic and abstract, and also applicable to the non-acoustical realm; while tone appears more sensual, directly connected to the auditory qualia.

Perfect pitch appears to be a very rare gift, if gift it is. According to Sacks only one in ten thousand individuals has it. This is rare indeed, and makes it statistically unlikely that you would ever encounter such a blessed (cursed?) individual. On the other hand the people we meet are never random but selected, which makes it more likely. And also low relative numbers translate into huge absolute numbers given the sheer enormity of the human population. In the States alone you would expect 30'000 people with perfect pitch, more people then there are professional mathematicians. And more than half a million worldwide, the majority of which, may very well be ignorant of their ability. Perfect pitch means that if you hear a tone, and you are told that it is called X, you will have no problem identifying it as X when you hear it later. Two things strike you about perfect pitch, Sacks reminds us, one why it should be so rare, would it not be something one would expect of everyone, except in pathological cases, after all we have all perfect pitch when it comes to color. We would be puzzled indeed if we encountered an individual who upon asked what color a particular ball would be, would stare at us blankly, but when being told that the curtains are yellow, would light up and smile and say 'red of course'. Secondly, and this is obviously connected to the first, why should perfect pitch have anything to do with musicality per se, would it not rather be an impediment? After all the abstract features of music are more relevant than their concrete manifestations, differences in tones count much more than the tones themselves. As Plato remarked, if not in such words, the immediate qualia of colors are non-exportable, but not differences between colors³. Thus you can see that perfect pitch would trap people into too literal an interpretation of music, yet perfect pitch is over represented among musicians, and seems almost to be a sufficient condition for musicality, although of course far from necessary. The reason for that being, I suspect, that people with perfect pitch must have a very sensual experience of sound, each tone appearing with much more individuality and autonomy, than it does to the general population. Maybe sound to them is like smell is to dogs? ⁴. Yet, most people are good at relative pitch and are able to recall and represent melodies, by singing or by

² I never realized fully as a child that the organ and the piano were instances of parallel evolution, homologous but not of the same origin. The organ is based on wind bellowed through pipes, while the piano is strings being plucked.

³ How do I know that my experience of blue is the same as yours? Maybe what I experience as blue you experience as red and vice versa? How would we ever find out? Of course the question is not well-posed and does not make sense when scrutinized. Thus when it comes to the qualia of our sensory worlds, we are indeed all solipsists, whose particular worlds will come to an end with our deaths. What we cannot communicate are the 'things in themselves', what we do communicate are 'things up to isomorphism' to use mathematical jargon. (In fact, to make a slight mathematical digression, whether two things are being the same only makes sense when they belong to the same set. That might be the underlying rationale of set-theory.)

⁴ Do I have perfect pitch? If so what an irony! Strictly speaking I do not know, because I do not realize ever having been told that a given tone is an X and then been asked to identify it later on. On

humming, feats that I believe are beyond me, and whose absence normally would earn me the epithet of tone-deafness. Thus I have always considered my technical musical ability to be below par⁵. One could of course blame lack of musical education and encouragement, as there was never any music at home when I grew up, as unlike most people we did not own a gramophone let alone a musical instrument⁶; on the other hand, at least one of my daughters spontaneously was able to sing almost at infancy. In fact my inability to sing was brutally documented at school and I earned a no-grade - a simple slash, in singing. Our musical teacher commiserated with my plight (which I may have shared with one or two others in my class, hence the rather precise estimate I made in a previous footnote) and told the others how much I missed in life, but I felt a certain perverse pride in my inability. However, much to the surprise of my teacher, I quickly took to musical notation, being rather intrigued by it⁷. Now, perhaps not surprisingly, my musical inability, set off a rebellious streak. I simply detested popular music, found singing embarrassing, and the idea of singing with others demeaning and affected. In particular I could never understand why so much of popular entertainment was geared towards music and singing. Now, music has a very social function, binding people together, and it might have been this social aspect I was rebelling against, not so much music per se. And I still believe that much of the popularity of popular music is due to its social function, appealing to the flock mentality. As a child I did not want to belong to the flock, taking pride in being apart, this maybe being more of a manifestation of arrogance than originality. On the other hand I developed a certain secret partiality for classical music, fragments of which I heard on the radio, and a certain partiality for church music of the solemn kind, due to sporadic exposures to church services. When I at eight was asked (among other things) to write down my favorite composer in one of those books that girls used to circulate around among their classmates, I choose Beethoven. My mother who spied on my activities, spotted it

the other hand, had I had such an, I am almost tempted to write olfactory, immediacy awareness of tonal qualities, would I not as the intelligent and curious little boy I was, been unable to resist the temptation to explore it further, even if there would have been no immediate support for such exploration emerging in my family? The only musical testing I was subjected to, was not really surprisingly initiated by my mother. She worried whether I was musical, being so was obviously considered a good thing, and an ambitious mother desires all good things to come the way of her offspring, if for no other reasons that it may reflect well on herself. I was taken to a musician, obviously of some authority, who played a few notes on a piano and asked me some incomprehensible questions, to which I responded at random, apparently much to his satisfaction, which reassured my mother. Privately I was very skeptical, how could such far reaching conclusions been drawn from so little information? Maybe he was just humoring my mother by setting up a little charade? Or, in retrospect, he might like a doctor listening to a heart, been able to tell that I could tell tones apart and correctly place them on a scale, i.e. knowing when one tone was lower or higher than the other, abilities which are very basic and indeed far from exceptional. Or he quickly realized that further testing would be embarrassing and thus aborted it quickly.

⁵ Maybe belonging to the lowest quartile, but perhaps not to the lowest octile, if I may be allowed to make a precise guess.

⁶ My father owned a mandolin, on which he never played, for reasons soon to become apparent

⁷ The same tendency I recognized in my son, who when offered musical instruction, was more fascinated by the musical notation than the music itself.

and sarcastically asked me what did I know of Beethoven. Nothing of course, it was a case of pure snobbery and she was perfectly right in censoring my affectation. Still, snobbery or not, it begs the question why I choose this particular kind of snobbery. Obviously, despite my technical inadequacy, music exerted an emotional pull on me, and classical music, so obviously unacceptable to my peers, appealed to my sense of apartness. And it is this ability to exert an emotional pull, even on the unmusical, which is the greatest mystery of music, and should constitute the central line of inquiry, in any commentary on the music and the brain, which is obviously the purpose of the present book.

Now musicality is widely recognized as an intrinsic ability, and not one based on instruction, unlike many other abilities⁸. For this reason, it is often assumed to have a direct genetic component and run in families. As noted, there was no music at all, when I grew up. In my mothers family there was no intellectual cultural background, in particular no tradition of musical activity. More surprisingly there was a very pronounced musical streak in my fathers family. My paternal grandfather and my uncle were passionate about music, as was my paternal grandmother, whose father had been a preacher known for his voice. My great grandfather and his brothers were musically very active, and one of them, who died very young, was rumored to have been musically very gifted. This might be somewhat remarkable, but hardly exceptional in older societies, in which music provided one of the very few structured activities that lifted people above their daily toil, and as already noted, may often have been pursued for merely social reasons. What might be remarkable (if not exceptional) is my fathers total rejection of the musical life in which he grew up. One reason may have been sibling competition. His older brother being so much more adept at handling musical instruments than himself would have been a strong discouragement, instead he fancied himself an artist, for which he had undeniable talent, and provided him with teenage ambitions, until he was allowed to continue his education and he discovered mathematics and physics. Another reason may have been the strong connection between music and religion, which especially his mother displayed, as she was also somewhat of a bigot, the latter became a natural target for rejection. Still I recall him from childhood adeptly whistling tunes, which he did in spite of himself, and always with ironic detachment. The fact that his amusicality was in the nature of a sustained resistance, became rather clear, when he finally a year before his untimely death, got himself a stereo, he started to listen to classical music with a strange abandon and intensity, as if a long suppressed desire finally was allowed to surface⁹.

Sometimes musical ability and mathematical are considered congruent, after all Leib-

⁸ It is often claimed by educators that everyone would be mathematically competent, provided given the right impetus and instruction, while in music, as in sports, appreciation of intrinsic differences of ability is not considered politically incorrect.

⁹ I had a similar experience, but much earlier in life, and of longer duration. What I most vividly recall from my seventh year in school, was the one hour instruction in music appreciation, we were given on Saturday afternoons. I knew nothing of course and was very much intrigued. In particular the teacher sensitive to her uneducated charge took pains to introduce us to 'representational music' such as Musorgskys 'Pictures at an Exhibition' and Smetanas 'Moldau': Pieces if music, I not unsurprisingly were the first I bought when I many years later for the first time had access to a gramophone. Then at Harvard, I got my own stereo, and started to build up a sizeable collection of classical records, which unlike popular

niz referred to music as unconscious counting. For obvious reasons this connection, if flattering in a romantic way, has always puzzled me. What does music and mathematics have in common? To be honest not much, protestations to the contrary notwithstanding. It is true that music has some kind of intrinsic logic, one thing leading to another; and much of music, especially the classical, shows intrinsic structure, especially those of symmetry. Things to which most mathematicians are sympathetically attuned. One may be then be tempted to speculate whether mathematically symmetries can be exploited and manifested musically, that Bach and Mozart were mathematicians at heart¹⁰. If so every simple group say¹¹, should generate its own kind of music, and composing could in principle be computer generated. Although extensive experiments in computer generated music have been made, and the field might still be rather active, I suspect that this is a wrong tree to bark up. Music is not about symmetry, nor about rules, but ultimately about emotion. There are symmetries of course, but the real strength of music lies at the very breaking of those symmetries¹². In short music is not an intellectual exercise, even if the classical kind easily can be thought to be so. And mathematics is even less about symmetries, although pervasive in much of mathematics, they provide but a miniscule part of mathematics, which is also much less about rigid logic than the public imagines. True music is about emotion, and one may be emotional about mathematics even if one can never express emotions through mathematics. In particular the activity of mathematics may be abetted by the listening to classical music (as can many other activities) and perhaps also by its performance, which is for most amateurs simply a more active act of listening.

A much more intriguing connection to music is given by language. Obviously they are not the same thing, but they seem, unlike mathematics and music, to share some mutually essential components. First language is first and foremost auditory. Spoken language is the basic form, written language is but a cultural embellishment, that displays many extraneous features, such as the notion of individual words, and strict formal grammars¹³.

records, also tended to be very cheap. I listened obsessively and got an undeserved reputation for being a music lover. Of course, unlike when I was a child, such musical interest was now very much socially appreciated, and I likewise was undeservedly commended for my good musical taste. After years of such sustained exposure I finally started to be able to identify some pieces of classical music, and was always very proud when so able, although I have never been able to form any internal musical imagery, even for pieces which I have strong emotional attachments to.

¹⁰ This idea is explored at some length in du Sautoys popular book on symmetry, and also made somewhat manifest in my own review of it in the EMS Newsletter, in which I suggest that any kind of (short) sequence of notes can be made into music if subjected to symmetrical embellishment and generation, not unlike the translates of a fundamental domain in geometry.

¹¹ To the non-mathematical reader: Simple groups make up the building blocks of symmetries, all but a very few far too complicated for the human mind to grasp intuitively and instinctively.

¹² I remember vividly Leonard Bernstein expounding on the almost symmetries of Mozart at a series of public lectures at Harvard in the mid 70's. Almost symmetries, but not rigid symmetries, was the lesson I brought home with me. And I have been told by musicians that computer generated music is ultimately boring and unsatisfying.

¹³ If you see a text where all the spaces between words have been excised, it does not make sense to

Every non-pathological child learns to talk, just as naturally and automatically as it learns to walk¹⁴; but for most people instruction is necessary to learn to read and write, and until recently only a tiny minority of mankind, learned to do so. Still many people get on perfectly without reading or writing, and one suspects that in spite of the increased literacy of the world population, their proportion is increasing. The connection between poetry and music is obvious, in fact much of the structural traditional features of poetry seem designed for easy memorization, which it shares with music. Furthermore, much of traditional poetry is sung, and to the uninitiated there may be very little difference between a song and a poem. But also good prose depends on rhythm, if not of the rather structured and rigid kind that characterizes poetry, as well as good disposition of material and thematic recurrence. Narrative itself, seems musical in its global structure. Could it be that there is something deeper than music? That music is but one way of expression, and if thwarted for one reason or another (tone-deafness ?), allowed alternate outlets, such as good prose (and maybe even poetry)¹⁵? However, one should never forget that language is ultimately about communication, while music is about expression. Language is a vehicle for information, music does not really go beyond itself. To this we will have occasion to return.

Music is part of the Beaux Arts. But it seems to have little in common with such things as painting and sculpture. The auditory sphere appears very different from the visual, and I suspect that the difference rather widens upon closer inspection, in spite of such notions as symphonies of color propounded by the likes of Kandinsky. Which is most abstract, music or painting? At first you might be tempted to think of music as the abstract art, and painting as the concrete. After all painting has a tradition of representation, while music represents nothing but itself. Also a painting is a concrete object, when it is lost and destroyed, it is gone and irreplaceable; while music has to be recreated every time it is performed, sometimes spontaneously, while the basis for it, its written codification, is but a short-hand, that can be copied indefinitely without loss, and which does not come alive until interpreted¹⁶ But the way we make a visual imagery appears very different from the way we make an audial. So called photographic memory seems to be rare, if it even exists

you, until you start reading it aloud. In spoken language there is indeed no pauses between words, the conclusion of one word being elided in the beginning of the following, and thus both being affected, not to say distorted, by the other. Also faithful transcription of spoken language are unreadable. Conversations in written form are intended to give the illusion of the real thing. One cannot speak as one writes, to try to do so, is declamation not speech. What is charming and essential in spoken delivery, is merely awkward in written form. And vice versa.

¹⁴ and I believe with the same narrow window of opportunity

¹⁵ As a child I dreamed about becoming a writer. One playmate, somewhat dim-witted, and as I recall attending a so called help-class provided with special assistance, incidentally a practice later to be abandoned in the Swedish school system on ideological grounds, remarked that I needed to be good at music. This remark puzzled and irritated me, as I obviously was not. It was explained to me about the connection to songs. Maybe ironically he had a deeper point?

¹⁶ Of course with digital technology, one can in principle record music and painting in the same way, pixel by pixel so to speak. As there are limits to human sensory discrimination, in principle this recording could be done faithfully as far as humans are concerned. It is also interesting to note that in former times

in the form we imagine it does, while a phonographic memory seems rather natural. What we see with the mind's eye appears very different from what we see with our real eyes. The image maybe vivid, or give the impression of so being, but it lacks substance, it does not have the power to occlude. It certainly seems to be a couple of orders removed from the real thing. The visual image imagined is a reconstruction of the abstract features of a scene, it appears to lack all the concrete manifestations that a real image has. We can easily imagine a fence without having to imagine every single board of which it is made up. We get the sense of it, but we cannot use it to make a drawing from it, the concrete details that are necessary for that purpose are simply lacking. As soon as we start to ask detailed questions about our image, they start to dissolve. While the auditory image is different. All of us have had the experience of hearing something said without getting its meaning, then being able to play it up again in our mind, and then to be able to get it. This does not happen with a visual memory, at least to most of us who lack the ability to retain a photographic image.

My visual education was much more involved than my (non-existent) musical. I was always encouraged to draw, and I did so, almost obsessively until the onset of puberty¹⁷ Although I never had any particular skill, yet at least as a young child my drawings were relatively sophisticated, with a good sense of perspective and depiction of movement. Pictures played a very important role in my imagination, and the illustrations of books were crucial to the enjoyment I derived from them. From an early age I looked at my father's art books and was introduced to many of the classical images. Vermeer I encountered as a four year old and was transfixed. My visual memory is good, have I seen a picture once I tend to remember it for the rest of my life, and I have usually no difficulty identifying a painter to whose works I have had some exposure, even if I have never seen that particular picture before. In short, when it comes to visual art, I have some real claim on expertise. Being still able to draw, the visual is married to the tactile, unlike in the case of music, when there is no muscular acquaintance due to my inability to play an instrument. While in music I am somewhat of a fake, as to painting my interest has legitimacy. When I see a painting in a museum I am sometimes tempted to retrace a particular sensuous line on paper, such as say that traced by the hip of the gorgeous nude by Titian in the National Gallery, simply for the tactile pleasure. Yet the distinctions I make between the visual and auditory image are probably more universal than I would initially assume, and are more

artists copied the works of other earlier artists as a means of training. Such practices would be inconceivable nowadays as an affront to individual creativity (although admittedly you often see in museums people who copy the masters with great fidelity. I do not know whether they do this out of eccentricity, training or as part of commercial projects, some people being prepared to pay good money for painterly copies). But a real artist copying another is unable to wholly submit himself, but invariably puts his own mark. I was reminded of this rather recently in the Prado by comparing a work by Titian with a copy of the same executed by Rubens.

¹⁷ My father always claimed that most children were artistic until the onset of puberty when they lost the knack. This is a very romantic notion, and as such uncharacteristic of him. I used to subscribe to it, but recently I have become persuaded by Vigotsky, who refers the almost universal cessation of spontaneous drawing at the onset of puberty, to the heightened critical abilities of the emerging adult and the greater demands made by their emotional life, leaving only the most accomplished to continue their craft.

due to the differences of the sensory media than to my own gradient of ability. In particular the visual and auditory sense are not in competition with each other, but occupy different realms and cater to different needs. The point is that no matter how vivid I may believe my recreation of images may be, they do not compare to those of the recalled musical image. The musicians do not just recall the sense of a piece of music in the abstract, but its concrete manifestations. They can use it to represent it, their memory is phonographic. While it is not even clear that we can imagine colors in our imagination, maybe we can only, as suggested by C.S.Pierce, conjure a conviction that we will recognize the color when we see it, the rhythm definitely, but maybe even the tonal quality of a piece of music is there when we recall it (provided we have that ability to recall at all). As Sacks notes, most of us have jingles running in our heads, jingles and pieces of music that occasionally can take on hallucinatory vividness with an autonomy of its own, beyond our voluntary control, and thus potentially tortuous. It is as if they have an independent existence in the brain. Such vividness and autonomy of visual images are very unusual, if they occur at all. It is in fact unclear to me the particular status of visual hallucinations as opposed to auditory, which I believe to be far more common even among psychotics. As to myself only occasionally have pieces of music inserted themselves in my mind, in spite of years of listening¹⁸ In many respects the concrete immediacy of the musical imagination recalls, as already noted, the olfactory faculty. True, primates as mammals are singularly deficient in their sense of smell, and our imagination is severely restricted. The world of smell is very poor compared to our world of sound and in particular sight¹⁹. In fact we can as little recall in our minds a particular smell, as we are unable to faithfully record a pain²⁰. Still

¹⁸ It must have happened a number of times, but I can only recall one, in the summer of 1978, when some bars from a symphony of Sibelius manifested themselves gently into my mind. I do not care particularly for his music, and am at a loss, why those particular notes should have made themselves so prominent in my imagination, which could be seen as a testimony to the autonomous nature of the experience. I did not find it unpleasant though, there was never any question of a hallucination, and for most people the experience would have been so commonplace as to elicit no notice, but to me it was a bit remarkable as well as reassuring.

¹⁹ The majority of the sensory information the brain has to process is visual. Most of us believe that the loss of sight would be catastrophic, a kind of death before death, while we tend to think that we can take deafness with more equanimity. Although I have been told that deafness is socially much more restricting than blindness. This makes sense because our social life is based on speech, which cannot be replaced by the written codification, so much of communication is based on the timbre of a voice, carrying with it emotional overtones, that are impossible to convey with the written word, at least not with the same directness and speed.

²⁰ The paucity of our olfactory world may be in some sense due to inhibition, and it could very well be the case, that our lives are influenced by subconscious smells, which may explain matters such as sexual attraction. Of course our apparatus for smelling is poorly developed compared to other mammals, and there is no way, no matter how uninhibited we may become, to compete with them. It is thus beyond our imagination to understand how a dog experiences the world. It must be a world dominated by smell, in which sound and in particular sight play but shadowy roles. The olfactory intelligence of a dog must be several magnitudes bigger than that of a man, and his emotions, to the extent of his having any, must be tied to smells more than anything else. Dogs need no music.

when we encounter a particular smell (or taste, the distinction is really not that significant) the experience, as Proust famously observed, has an immediacy that the other senses lack. It is almost as if the olfactory memory is so directly imprinted in the brain, that there is no need to reconstruct it, and thus all the associations attached to it, come forth with an immediacy which makes us feel transported in time²¹.

One of the major recurring themes in the published case stories of Sacks is the saving grace of music in patients with severe amnesia. Music restores a sense of the flow of time, in an otherwise infernal presence with no duration or continuity. In particular the well-known case of X. suffering from an extreme short-term amnesia, with a present of only a few seconds duration, returns to normal when he is playing or conducting music. Even people with more less specific brain-injury, such as that caused by old-age dementia, become so to speak normal when confronted with music. They may not retain any episodic memory, or even having their semantic memories impaired, yet they are able to be carried along by music, being able to sing long songs, and if previously capable, still able to perform it²². It is natural to think that one could exploit this unimpaired capability to serve ulterior purposes, such as providing external memories. But it does not work that way, music can carry no information, it is a thing closed onto itself. This very fact may be the most interesting and revealing clinical insight of the book. To appreciate music, to appertain it and retain it, appears to be a very simple and natural thing for the majority of people, with no advanced cognition involved. To understand and comprehend a visual scene requires much more of internal reconstruction than appreciating a melody²³. When my mother became more seriously demented, she lost her ability to paint. As music had never played any important role in her life, this avenue of solace was denied her.

How does music really relate to the neurology of the brain, in particular where is it situated geographically speaking so to say? One suggestive and charming idea is that it is the right counterpart to the logical left-hemisphere of mathematics, which would to some extent explain the relationship between mathematics and music, which I was at some

²¹ Smell could be very sensitive, single molecules being able to generate the sensation, as with insects. The reception is also very direct, each molecule carrying a specific scent, being recorded by a specifically attuned receptor, to which it fits as a key to its lock.

²² My own paternal uncle, in poor health, physically and mentally, was able until his death at ninety, to perform music, the last few weeks in bed playing the flute. This impressed me very much. To be able to perform such feats, which would be completely beyond me.

²³ This may appear paradoxical, especially for some one like me. Music, at least classical music, used to sound pretty much the same to me, and only through repeated exposure was I able to make out its individuality. This is in many ways still true, listening recently to a succession of some Hndel Organ concertos while doing some mathematics, I found it very nice and supportive, but in retrospect it all sounded the same. On the other hand I noticed early on that a piece of music touched me much more deeply if I happened to listen to it in the twilight state of falling asleep. What otherwise may have sounded a bit flat, suddenly acquired volume and an emotional resonance previously absent. Of course much of this may be due to my own inability, combined with the fact that classical music may be much more complicated than more popular and accessible music, being more in the nature of narratives with recurring themes, than catchy refrains. Still intellectual as classical music may seem, and no doubt particularly amenable to such attention, this is not what it really is all about, as noted earlier.

pains to reject above. An intriguing source of illumination is given by the existence of a tribe of humans that go under the label of the Williams syndrome. Those are people that seem lifted out of the fiction of a Tolkien, and would I not have known better, I might have been tempted to suspect that Sacks just made them up, tongue in cheek. Those are people, who for practical purposes are classified as retarded. They are singularly incapable of functioning on their own in our technological civilization. They lack very basic cognitive skills such as counting and logical reasoning, and hence fare poorly on standardized I.Q. tests. However, they have a great capacity for music, in fact their lives are imbued with it to an extent you would not find among normal people (the great classical composers included?). Along with this goes a very pleasing and innocent social personality, seemingly free of mistrust and guile. They are caring and sensitive, and they also have a great fondness for narrative, in which they also excel, displaying a vivid vocabulary, especially of the evocative kind. Sure enough the geography of their brains differs significantly from normal controls; some parts are well-developed others atrophied. The exact description of this difference did not make much sense to me, and I suspect even to those to whom it does may not yet be in a position to draw any truly significant conclusions from it yet (which is, I suspect, typically of neurology), so it remains so far but a tantalizing fact.

Why has music evolved? What is the reproductive advantage of music? Those are nowadays inevitable and standardized questions. However, I think that they are not well-posed, and constitute barking upon yet another wrong tree. Reproductive adaptation is a coarse instrument indeed, much less concerned with fine-tuning than weeding out the grossly unfit and self-contradictory. Music is most likely evolutionary neutral, its widespread occurrence a matter of chance, the unpredicted consequence of other evolved features²⁴ Music should perhaps be seen as a 'resonance' of the brain, existing for itself, just as (the subtler) emotions of a human, exist for themselves. No one ever really asks what is music good for, what are its applications, it is simply accepted as an end in itself. This is further corroborated by its inability to do useful work in the case of demented patients. By asserting itself it gives a sense of identity and happiness, but what is the use of happiness? What is its ultimate purpose, except itself?

What other features of the human mind are like music? Maybe religion? Once religion is stripped off its egregious superstition and its occasional ambition to go beyond itself and explain the physical world, what remains may be but an artistic expression of the human condition. An expression as such traditionally close to music²⁵.

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²⁴ Most people are very adept at driving cars. Clearly this is not a skill that has been specifically evolved, there having not even been a generation for it to do so! Similarly traffic lights provide good markers in giving directions in cities, but that was never an intended feature when they were designed.

²⁵ The sacral sources of music, not only classical but also jazz, ought to be obvious. But is this particularly characteristic of Christianity, and not at all as pervasive in the Muslim tradition?