Towards a Definition of Harmony in Music and Agriculture
An Open Letter to HRH The Prince of Wales

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Sir, you know me in my capacity both as a musician and as a farmer. To some people these two disciplines seem odd bedfellows; yet to me they complement each other naturally. Ever since I was a boy growing up on a Dorset farm I loved being involved in all its activities - from lambing and calving, to feeding the livestock, harvesting the crops and threshing the wheat. As luck would have it my parents were pioneer organic farmers as well as keen amateur musicians. Thanks to them it never occurred to me that there was anything odd in the way they linked farming with music, or in the plays they devised to mark the changing seasons of the farming year with folk song and dance, polyphony and chamber music. I grew up to appreciate how vital both agriculture and music are to the health of our species - one to feed the body, the other to feed the soul. I came to realise that I wouldn't be satisfied in life with the one without the other. That was reason enough for me to attempt to combine and balance them in my professional life. In practise, allocating time and giving sufficient attention to both roles has proved a complicated juggling act, for both professions are all-consuming and carry immense responsibilities and challenges. Depressingly, both are often officially undervalued, misunderstood or pushed to the margins of public consciousness through other pressures. One can gauge the degree of importance attached to them by UK governments over the past thirty years by the fact that Agriculture and the Arts are usually the last two ministerial portfolios to be handed out by successive Prime Ministers. How can that be seeing that the one carries responsibility for the safety of the food we eat, the water we drink and the air we breathe, and the other for the cultural and spiritual sustenance of the whole community and, crucially, for the imaginative development of our children?

This downgrading of two such fundamental disciplines is symptomatic, it seems to me, of a prevalent loss of wonder at the earth's delicate, fragile life-supporting systems - the very things that nourish our existence and the wellsprings of our creativity. Over time we have lost much, if not all, of our sense of harmony - or of what it's like to live harmoniously within our physical

environment. Harmony by its very essence predicates and generates a balance between opposing forces, or in musical terms, 'the combination of simultaneously sounded musical notes to produce a pleasing or agreeable effect'. That sounds all very fine in theory, some people will say; but in practice, what benefit is it to them in their daily struggle to earn a living and to keep pace with bewildering change, they might ask. What has it got to do with our reconnecting with nature or with saving the planet? Doesn't music along with the other arts just cloud reality? Escapism is not what the natural world in crisis needs at this point, it could be argued.

I have to admit that classical music is particularly bad at presenting its own case. On the one hand it is widely recognised as one of the greatest achievements of the Western mind, but on the other it betrays its origins in social privilege and exclusivity. Most of the musicians I work with regularly are acutely aware of this paradox. Coming from all over Europe, Asia, Australasia and the Americas they have learnt the hard way: how to juggle cultures and from direct experience how opinions and prejudices divide men and women, knowing that the activity of music-making unites people regardless of social class, gender, age and ethnicity. Perhaps the most urgent task for us musicians now is to convince our audiences that, for all its mysterious, indefinable attributes, music is rooted in the soil and earth of our - and their - everyday lives. Music exists in an imperfect world in which social injustice and inequality threaten to constrain the potential of individuals; but it has the power to refresh, give hope and purpose, and even to transform people's lives.

A few years ago I came across a note that J.S. Bach wrote to himself in the margin of his copy of the Holy Bible: 'NB. Where there is devotional music, God with His grace is always present'.[i] This was a covenant as binding on Bach (perhaps the greatest musician the world has ever seen) as God's promise of the rainbow was to Noah. Bach is referring to a powerful phenomenon known to (but not always admitted by) musicians whenever they meet to make music together: the potential access we are given to a world of grace and truthful experience that no other art form can offer to the same degree. Engagement in the spirit of devotion with music by Bach or any of the great composers of the past four or five hundred years can help us to understand that vibrant creativity and the rooting of music in a given order need not work against each other, but can be combined harmoniously.

Harmony is a beautiful word and concept. Yet I'm bothered by the way it is used in common parlance. It doesn't seem to have much inherent substance beyond a vague, feel-good notion of 'being in a state of agreement or concord'.

As a definition this seems to me to fall well short of the mark. Slightly better might be 'a means of connecting unrelated or loosely related concepts to concur and meld in a benign way', but even that sidesteps the crucial mathematical and philosophical roots of musical harmony.

So for a moment may I ask you, Sir, to return with me to the very origins of harmony - to the discovery at some point in the fifth century B.C. of the harmonic structure of music? Pythagoras experimented with a stretched piece of string. When plucked, the string sounded a certain note. When halved in length and plucked again, the string sounded a higher note - completely consonant with the first. In fact it was the identical note but at a higher pitch. Pythagoras had discovered the ratio 2:1 - that of the octave, in other words. Plucking the string at two-thirds of its original length produced a perfect fifth in the ratio of 3:2. When a three-quarters length of string was plucked, a perfect fourth was sounded in the ratio of 4:3, and so on and so forth. The pitch of a musical note is thus in inverse proportion to the length of the string that produces it. These sounds being all consonant are generally accepted as pleasing to the human ear - and they have stood the test of time. Yet the significance that Pythagoras attributed to this discovery went far beyond mere euphony. Finding that harmonic music is expressed in exact numerical ratios of whole numbers demonstrated to him the intelligibility of reality and the existence of a reasoning intelligence behind it. He considered that the harmonious sounds that men make, either when singing or playing their instruments, were an approximation to a larger harmony that exists in the universe, one which is also expressed by numbers. This, he proposed, was 'the music (or harmony) of the spheres'.[ii] If the Sun, Moon and planets all emit their own unique hum based on their orbital revolution, he concluded, then music must be the ordering principle of the universe. In this way music came to be understood as being based on natural laws. Its value derived from its capacity to frame and elaborate these laws in musical form. Aristotle tells us that the Pythagoreans 'supposed the elements of numbers to be the elements of all things, and the whole heaven to be a musical scale and a number'. In other words, music is number made audible. The heavenly spheres and their rotations through the sky produce tones at various levels and pitches. When brought together in concert these tones create harmonious sounds that resonate with man's sense of participation in the harmony of the universe.[i]

To many people the appeal to planetary motion as the foundation of musical harmony might seem faintly ludicrous; yet in today's noise-polluted world it retains traces of the elemental force that our ancestors acknowledged and valued when they celebrated music's magical, mythical origins. Claude Lévi-Strauss,

France's leading 20th century social anthropologist, described the function of myths in primitive society as 'resolving contradictions'. He went on to define music as 'the supreme mystery of the science of man'.[iii] However hard we try to explain the beauty of music in the end it can only deprive it of its mystery. What audiences hear in a concert performance is just the finished article - like a polished stone or a diamond - but they have no yardstick with which to assess its true worth. It is part of our job as musicians to convince listeners that they can participate not just as spectators watching and listening while others of us perform, but by being inspired through direct exposure to its beauties in the very process of its being put together. Unless we can show people how harmony is formed music could become a dying art. We can do more, perhaps by inviting them into the fulcrum of rehearsal - into our work-place. For just as the priest needs to recognise that harmony can be achieved not just in church but in a secular context as well, so the musician needs to acknowledge that harmonic rhythms can be replicated in something as seemingly unconnected as agriculture, while even the experienced farmer can learn that there is a harmonic component to the right and responsible way to treat his livestock as well as his children.

The idea of 'the music of the spheres' runs through the history of Western civilisation like a golden thread and with tenacious consistency. At first it was treated quite literally as the sounds of a cosmos regulated by the fixed and constant motions of the planets, audible to God but not, since the Fall, to man. Music was seen more as a discovery than a creation, because it relied on pre-existing principles of order in nature for its operation. During the early sixth century A.D. a book called *The Principles of Music* appeared which was to have enormous influence throughout the Middle Ages and beyond.[iv] Its author, Boethius, believed that arithmetic and music were intertwined. He proposed that music is related not only to speculation but to morality as well, for nothing is more consistent with human nature than to be soothed by sweet modes and disturbed by their opposites.[2]

By the early 17th century astronomers and mathematicians were struggling to discover a set of rules common to both music and the newly observed movements within the solar system. In *The Harmony of the Universe* Johannes Kepler proposed a new theory of musical harmony and a cosmology of the heavens and the earth. Much of this fascinating book is devoted to proving how harmonious consonances correspond to the geometrical archetypes in the mind of God and the soul of man. Kepler set out to prove the relationship between the musical ratios and the motions of the planets. He discovered that the solar system's planets follow elliptical, not circular, paths. He based his version of music of the

spheres on the relative maximum and minimum angular velocities of the planets measured from the sun. 'The movements of the heavens are nothing except a certain everlasting polyphony', he wrote.[v]

At around the time as astronomers like Kepler and Galileo were transforming the way people understood planet Earth's place in the cosmos, a radical shift was taking place in the world of music. Suddenly there was a challenge to the old Pythagorean view that the rules of musical practice could simply be deduced from nature itself through a mathematical study of harmonic proportions. Throughout the Renaissance composers had struggled to achieve perfection in linear counterpoint as a way of reflecting divine order. Then along came Claudio Monteverdi. The exact contemporary of Galileo, Kepler and Shakespeare, he bucked this trend by looking at music's role from a more human perspective: how we stand in relation to God and to our neighbour and, above all, how our emotional life can be expressed through music. Monteverdi's primary concern as a composer was not so much structural perfection (though he excelled at that, too) as expressive force. He was in effect the first composer to harness the power of music to express and encompass the full gamut of human emotions. His whole life was spent probing and extending music's capacity to reflect the relationships of men to women and women to men and their collective response to the existence of God. Replacing the old church modes with something far more assertive and even abrasive at times, Monteverdi uncovered a new richness in diatonic harmony (as we would now call it). Harshly criticised by conservative theorists of the day, he was a pioneer in using dissonant chords to generate moments of acute emotional and sexual tension via a series of harmonic crunch points which always resolve back to a consonance. As Ben Jonson said around the same time, 'All concord's born of contraries'.[vi]

By the early 1600s we arrive at a way of describing harmony in music based on the Christian symbol of the Cross - as the fruitful intersection of a horizontal plane made up of melody and rhythm and a vertical plane comprising chords and the spacing of musical intervals. Now the thing is this: could we not say something similar when defining the harmonious basis of agriculture? Isn't it possible to see soil structure and biodynamic vitality as forming the 'horizontal' dimension standing in a symbiotic relationship to crop- and animal-husbandry which form the 'vertical' dimension? Problems, all-too-familiar in today's industrialised agriculture, pile up when these two dimensions cease to operate harmoniously and start to collide. Just as some people find discordant or atonal music disturbing, many others feel that chemically-based agriculture is out of kilter with the principles of harmony: that it disrespects and ultimately degrades

the very source of our nourishment, fracturing the two-way relationship whereby the soil yields its fruits in return for the honour and sanctity we accord to it. In the past fifty years this veneration for the process has become diluted and has now almost disappeared from farming. Yet in the same period it has increased significantly in the sphere of music.[3] The central core of both farming, forestry and music is not ownership, but stewardship. As stewards we have a duty to be fully accountable, as well as grateful, for all that has been entrusted to us. It is the essential 'give' and 'take' which is such a vital ingredient in the fruitful interaction between musicians.

Music and farming share this, too: they come to life and unfold in real time - in the duration it takes to perform a piece of music or for the growth cycle of a plant to complete its life-span. Agriculture like music is part interpretation (in its contingency upon the weather, the water table, and on soil analysis), and part performance (in the ways we sow, cultivate and harvest our crops). Craftsmanship is common to both activities. Inspiration, on the other hand, is a much less dependable commodity: for while it is possible to create favourable circumstances which allows inspiration to strike (and it can be humbling if and when it does), it needs to be treated more like a bonus or even a blessing and not as a dead certainty. Our forebears treated farming as a devotional activity culminating in a ceremony of thanks at the conclusion of each of its cycles. These celebrations were marked through sacred forms of song and dance. Yet although many of these rituals are disappearing I am convinced that children can still respond to them - especially harvest festivals - just as I did when I was growing up. The Ashley C. of E. primary school at Walton on Thames was a model of its kind during the time Bryony, my youngest daughter, taught there. Richard Dunne was headmaster at that time, and gave children a wonderful introduction to the principles of harmony, showing them, for instance, how to grow their own food and encouraging them to participate in the cooking of it. Miraculous moments occur in the preparation of food just as they do in rehearsing music, no matter if it's slanted towards a school concert or a grand symphonic affair. As in the rehearsal room, the kitchen becomes a laboratory where children respond to the enthralling alchemy when ingredients suddenly fuse together. I have never forgotten the thrilling moment as a child when my mother, after stirring thick cream in a jar for what seemed like hours on end, suddenly caused it to turn into butter.

My great-uncle Balfour Gardiner was a composer of lush romantic music inspired by the English countryside, all of it well-crafted and some of it strikingly beautiful.[4] But after hearing the experimental music of the second Viennese school

in which chromatic expressionism without a firm tonal centre began to take hold, he decided that his time was up. During the bleak years that followed the Great War he gave up composing music altogether. He decided to burn the bulk of his compositions and to plant trees instead. In 1924 he bought seventy-five derelict acres on an outcrop of the North Dorset Downs. He appealed to his nephew Rolf (my father), who was then in his early twenties, to join forces with him in a venture of rural regeneration centred on Gore Farm in the parish of Ashmore. It was to provide much needed employment at a time of economic depression. My father accepted the challenge and went off to Dartington Hall to train as a forester. Soon afterwards uncle and nephew embarked on restoring this stretch of chalk downland on this western edge of Cranborne Chase, that once huge tract of royal forest which had become denuded of trees and badly eroded through rabbit scrapes and screes. They had big ambitions to create 'a harmonious matrix of hedgerows, orchards and well-managed woodland for shelter, to prevent erosion, to provide trace elements from the subsoil, to maintain the water table, to moderate extremes of heat and cold, to provide humus from the forest floor, to harbour wildlife, an efficacious drainage system, a varied diet for livestock, to provide continuous stability, to avoid having to import wood products from abroad'. Quite some list! Over a period of nearly forty years they planted three million deciduous and non-deciduous trees on the impoverished soils on the fringes of the Chase. The results of their efforts are still there today for all to see.

Unlike his uncle, my father never gave up music. He sang on his horse or on a tractor and was a great believer in the value of collective music-making in binding communities together. To him the real issue of the time was the conflict between what he described as 'the divine order of music and the diabolical disorder of noise'. As a farmer and tree-planter (and a founder member of the Soil Association) he saw the reassertion of the principle of music, of rhythmic form, both as a grave duty and as a source of heart-giving joy. He set a premium on the sanctity of life, and adopted unfashionably what he called a 'sacramental approach' to agriculture. He strove all his life to restore a balance between the new and the old, to create new contexts for ancient structures and sacred mysteries that had been lost over time. When I was aged 20, I told him that I had set my heart on becoming a professional musician and a conductor, but he was vehemently opposed to the idea. Music should never be an end in itself, he insisted. The way he saw it I was about to sign a Faustian pact which would fracture the vital practice of communal music-making linked to the seasonal rituals of farming and the turning year - the very things he had taught me and my siblings to respect all through our childhood. And so we argued. Then, just months before his untimely death

in 1971, he gamely came round to the idea that there might after all be merits in my dream of combining professional music-making with the tending of the land. We were finally reconciled. It is to him that I owe my awareness of the cycles of nature and the rooting of music in the soil and its connection to the rhythms of sustainable farming and forestry. And there was another valuable lesson I learnt from him (and one so easy to forget): how to take a nourishing intake of breath before any strenuous creative effort, and how to gather oneself in humility on the edge of performance through a conscious surrender of self-will. It is a pathway towards achieving that X factor - the one thing which can transfigure a routine musical performance into an illuminating and irradiating miracle.

I am greatly indebted to you, Sir, for appreciating that music-making at all levels fosters human interaction: that as a shared activity it is collectively empowering and that it speaks directly to the individual in ways inaccessible to rational argument and dispute. Beyond that I believe that music in its widest sense provides a paradigm of balanced, harmonious coexistence and that it engenders a sense of reverence and mystery which has largely leached out of our approach to nature and to the soil and to the way we grow and treat our food. Many people who respond eagerly to classical music feel alienated by the jargon and hype that surrounds it. Yet who can blame them? We now have proof that the music of Bach and Mozart opens up neural pathways to the brain which can otherwise become starved of nutrients. If our children are not given regular access to these nutrients they remain deprived, maimed even, in some fundamental way.[5] It used to be thought that we process art and music in the right hemisphere of our brains, with language and mathematics located in the left. No longer. Recent research in the neuroscience of music now shows that the activities of composing, performing and listening to music spread to almost every area of the brain and involve nearly every neural subsystem. I find that a wonderful thought.

You, Sir, have consistently and courageously shown us the paramount need for the principles of harmony to be respected, emulated and extended throughout our society and body politic. It is easy to be overawed by the size of the task and the constant fight with gremlins at every stage of the journey. Your generous patronage and skill in connecting people from different fields of expertise continues to have a palpable impact across the globe, as was so clear to me when talking to delegates at the Dumfries House conference on the Future of Food and Farming in 2017. It drummed home to me how our sense of shared culture, our irrefutable knowledge of our planetary environmental interdependence, has so far not registered widely enough to prevent us from the ecological imperative to cooperate at a national and international level in order to halt escalating,

irreversible environmental damage. As human beings we are both a part and product of nature, yet we have the capacity to influence its processes - for good or evil. We need constant reminders that our actions have far-reaching effects on other living organisms and creatures. Like them, we need space and repose, music for our souls, food for our minds as well as our bodies.

At Dumfries House I sensed a general consensus about the aims of sustainable farming: to produce healthy food that gives nurture and pleasure to our taste buds while being harmonically consonant with nature. Speaker after speaker extolled the need for responsible animal and plant husbandry and to account for the true costs of production. These need to be reconciled harmoniously, yet in our century this rarely happens. Too often dissonant or what we musicians call 'bum' notes are struck through the promiscuous use of agro-chemicals. If our children are not encouraged to explore the responsible ways and practices of how food can be grown, planted, tended and harvested, they risk being cut off from the vital chain of nature and sustenance. Thirty years ago, Leonard Bernstein had something important to say on this topic.[6] Towards the end of his life, he wrote:

> We destroy our children's songs of existence by giving them inhibitions, teaching them to be cynical, manipulative, and all the rest of it… [vii]

> You become hardened; but you can find that playfulness again. We've got to find a way to get music and kids together, as well as to teach teachers how to discover their own love of learning. Then the infectious process begins… Think of what we can do with all that energy and all that spirit instead of eroding and degrading our planet on which we live, and disgracing ourselves as a race. I will spend my dying breath and my last blood and erg of energy to try to correct this impossible situation.[viii]

And so he did. That was in 1989. Surely the task is even more urgent today.

It is through the example of a Lenny Bernstein and the inspirational leadership of yourself, Sir, together with men of vision like Patrick Holden, Richard Dunne and a few others, that our best hopes for the future lie. Thank you for showing us the way and for supporting those of us who firmly believe that we need to bring back the principles of harmony - *musical* harmony - to their rightful place in the foreground of our discussions about, food, farming, forestry and the health of the environment as well as of ourselves. Meanwhile we musical pilgrims sing on.

Notes

i. Howard H. Cox (ed.), *The Calov Bible of J. S. Bach* (Ann; Arbor: UMI Research Press, 1985), p. 419; Hans T. David, Arthur Mendel and Christoph Wolff, *The New Bach Reader* (New York : W.W. Norton & Company, 1998), p. 161.

ii. Piero Weiss and Richard Taruskin, *Music in the Western World* (noplace: Cengage, 2008) p.3.

iii. Claude Lévi-Strauss, *Mythologiques I: Le cru et le cuit* (1964), quoted by George Steiner, Errata: An Examined Life (London : Weidenfeld & Nicolson, 1997), p.63.

iv. Boethius, *De institutione musica*, trans. Calvin M. Bower, Claude V. Palisca (ed.), (New Haven & London: Yale University Press, 1989).

v. Johannes Kepler, 'Epitome of Copernican Astronomy: IV and V. The Harmonies of the World: V' trans. Charles Glenn Wallis, in Claudius Ptolemy, The Almagest, trans. R. Catesby Taliaferro (Chicago: Encyclopaedia Britannica, 1952), pp. 839-1085 (p.1048), https://www.sacred-texts.com/astro/how/how08.htm.

vi. Ben Jonson, *Cynthia's Revels*, edited by C.H. Herford and Percy Simpson (Oxford: Clarendon Press, 1986), Act V scene ii.

vii. Jonathan Cott, *Dinner with Lenny: The Last Long Interview with Leonard Bernstein* (Oxford: Oxford University Press, 2013), p. 74.

viii. Cott, *Dinner with Lenny*, p. 76.

1. In the *Republic* Plato taught that 'rhythm and harmony find their way into the inward places of the soul on which they mightily fasten, imparting grace, and making the soul of him who is rightly educated graceful' (Plato, *Republic*, 2 Vols., trans. Paul Shorey, Cambridge Mass., London: Harvard University Press, 1935, 401d). He pointed to Damon of Athens to demonstrate the political significance of music's power. Damon claimed that he would rather control the modes of music in a city than its laws, because the former have a more decisive impact than the latter on the formation of the character of its citizens. At the same time these ancient Greeks were wary of music's powers because they understood that, just as there was harmony, there was also disharmony. Just as musical concord can nourish the spirit, so musical discord can assault or damage it. It's an age-old theme.

2. What is it, then, in and about music, that gives us an experience so outside of ourselves that we feel we can see reality anew, as if newborn in a strange but wonderful world? The composer, the late John Tavener proposed an answer to this mystery in his artistic credo: 'My goal is to recover one simple memory from which all art derives. The constant memory of the paradise from which we have fallen leads to the paradise which was promised to the repentant thief. The gentleness of our sleepy recollections promises something else. That which was once perceived as in a glass darkly, we shall see face to face. We shall not only see; we shall hear.'. (see Robert R. Reilly, *Surprised by Beauty: A Listener's Guide to the Recovery of Modern Music* (San Francisco: Ignatius Press, 2002) p. 438.

3. This is shown in the respect and faithful attention that musicians now regularly give to the exact notation and implied intentions of composers of the past. It has been the springboard for what is now known as HIP (historically informed performance) which has given intellectual ballast to the Early Music Movement of the past 75 years.

4. In 1912/13 Balfour Gardiner put together and conducted a trail-blazing series of

eight symphonic and choral concerts at the Queen's Hall, London, with each programme devoted to living British composers. Amongst them was Hubert Parry whom Balfour invited to conduct his own Fifth (and final) Symphony in February 1913.

5. You will undoubtedly be aware, Sir, of the several green shoots of innovative music-making taking place within a social context today. So, for example, the Irene Taylor Trust not only brings music into prisons, but it also helps released prisoners to get their lives back on track through live performances and training placements. A few years ago the journal Psychology of Music published a study involving fifty children aged eight to eleven, from which the researchers concluded that interacting with music made them noticeably more emotionally attuned to others: just an hour a week of musical activity during term time increased their emotional empathy.

6. People forget that Bernstein was not only a famous conductor and composer, he was one of the greatest musical educationalists of the last century. A selection of his Young People's Concerts, for example, which delighted and educated millions of children for 14 years (1958-1972), has been re-issued on video.