

respected friend
Mr Black

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A TREATISE
(Explanatory of the Principles constituting
THE
Practice and Theory
OF THE
VIOLONCELLO;
AND OF
a Systematic method of Fingering,
Fully Exemplified in
Every Compass of the Instrument;
with a
Description of the Harmonics
throughout its whole Extent;
Illustrated by delineated Figures, and Experiments
ascertaining the nature of the
HARMONIC SYSTEM;
AND
Containing also a short account of the
RISE, PROGRESS, and GENERAL ELEMENTS OF
Music
as far as the Work
necessarily requires such Illustration.

By John. Macdonald Esq. F.R.S. E.A.S.
late Lieu^t. Col. Engineer, and Author of several Works.

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TO
HIS ROYAL HIGHNESS
GEORGE PRINCE OF WALES,
PRINCE-REGENT

OF THE
UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

SIR,

THE gracious condescension experienced by all who have the happiness of approaching your Royal Highness, enables me to offer my most grateful acknowledgments for the solicited honour of this Dedication.

In the classical literature of ancient Greece and Rome, equally as in the languages and belles lettres of modern Europe, it is well understood that your Royal Highness is among the first proficient: and in studying sciences essentially connected with the interests of the exalted empire whose sceptre you are destined to wield, that of Music attracted your attention at a very early period.

Its leading influence over the human mind, and its effects in gradually promoting general civilization, have been duly appreciated by your Royal Highness: and you are known to have paid a particular attention to national airs, songs, and martial music, from a sense of the enthusiastic and patriotic ardour which they are calculated to inspire. During a long residence in India, I have observed this effect; and when I visited France with a view of unfolding the state of tactics and discipline of that country, I marked the powerful application of music to warlike purposes.

The British Navies and Armies are fully apprized that their PRINCE REGENT is not only a superior judge in these cases, but that he is the

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constant Patron and Encourager of every other art and science practically connected with their welfare and discipline; and with the happiness, glory, and prosperity of Britain, not less distinguished by arts and arms, than celebrated for the continued practice of the virtues of philanthropy and benevolence.

As it is an axiom in the first of sciences, that “the whole is equal to its parts;” so any attempt to improve a detached department, may ultimately tend to ameliorate the general subject. It is under this consideration principally, that I humbly presume to present the present work to your Royal Highness; fully sensible that I can convey no instruction to a Prince of acknowledged taste in music, and highly skilled on the superior instrument, the theory and powers of which I have feebly attempted to illustrate.

I cannot permit myself to close this imperfect address, without recording my admiration of the wisdom of your Royal Highness’s Administration, so forcibly and justly impressed on the public mind.

I have the honour to subscribe myself,

With the utmost deference, duty, and respect,

YOUR ROYAL HIGHNESS’S

Very faithful and devoted Servant,

JOHN MACDONALD.

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P R E F A C E.

ACCORDING to the statements of ancient authors, it appears that Music was made an incitement to moral action. The distinguished achievements of illustrious characters constituted, through the medium of melody, the strongest inducement to virtue : and stimulated mankind to a meritorious course of heroic conduct, and to those patriotic deeds which embellish the pages of ancient history. Many of the eminent philosophers of antiquity, however much their various systems might differ in other respects, have uniformly recommended the practice of Music, as conducive to purposes of the highest public utility. Plato and Aristotle have expressed the most decided approbation of this sublime science, which they justly considered as efficacious in forming a beneficial national character, and in producing a patriotic attachment, proof against "treasons, stratagems, and spoils." While gymnastic exercises rendered the body hardy and robust, the influence of "sweet sounds" softened and humanized the general manners, and substituted regulated feelings, and correct habits, in lieu of unrelenting ferocity, and the barbarity which marks the savage state. Eminent as have been the services rendered to the cause of society, in former times, by the power of Music, it is only at later periods that it has assumed the form of an art, and attained to the dignity of an established science. There is reason to conclude, that it arrived at no inconsiderable degree of refinement among the Greeks : but of this the distinct traces and records are lost, though much ground for reasonable conjecture remains, from a due consideration of what has escaped the ravages of time, and has been transmitted in a genuine form. During the dark and middle ages, the practice of Music was principally confined to the Church, and was as imperfect as that era was rude and unpolished. In the present age, Composition, under the guidance of abstract science, has arrived at a state deemed by many almost a *maximum* ; but from the multiplicity of refinements (many of them equally capricious and fastidious) which have been introduced, it is much to be feared, that truth and nature are too frequently lost sight of ; and when such a case becomes applicable to a science founded on feeling and cultivated taste, its degeneracy is at no great distance. We sincerely deprecate this evil, and trust that the great Composers of the day will look to what Music was, when Handel and Corelli corrected the exuberance of fancy, and confined it within those legitimate limits, beyond which imperfection must commence. The cause to which this noble science owes its most attractive, powerful, and universal charms, lies

deep in Nature herself; and while this impression continues to prevail in the mind of a Composer, his harmony will retain its empire over the mind, because the sources from which he derives it will be permanent and pure.—Of all the gratifications of human life, that yielded by Music is probably, that alone which is without alloy. Sense is indulged with the approbation of reason; and though the delight may be fugitive, it may be perpetually renewed without any dereliction of innocence, provided it be not made the business, instead of the recreation of life, from which neither splendour nor obscurity can remove vexations wisely incident to a state of probation, thus tempered by the fascinations of a soothing science. There is sacred, as well as profane authority in abundance, for believing, that the practice of Music was made subservient to the general cause of virtue and of public morals. Harmony was, always, made a symbol of the order and symmetry prevalent throughout the whole compass of material and intelligent nature; and its value in influencing political conduct and general motives, was duly appreciated by the wisdom of antiquity.

If what is stated, thus briefly, be fact, let no one, who has not intimately weighed this momentous and important subject, yield so far to unworthy prejudices and misconceptions, as to disapprove of any attempt to elucidate or improve what may be calculated, however indirectly, to meliorate the condition of Society. Whoever has not taken a philosophical view of the general subject, has yet to consider it in its primary aspect. The practice of a science, and the influence it is capable of producing in a moral point of view, are distinct considerations, which, united, lead to consequences connected with the best interests of social order, which is in itself analogous to Harmony.

It is unnecessary to anticipate here, in almost any degree, the account which it was judged eligible to give in the following small work, of the origin of Music, and of its state among the ancients. As the work, however, is rather of an uncommon description, a general sketch of its features may be expected in this introduction.—The present instrument may be traced to various modifications of the Cithara. It resembles many stringed instruments which we have seen, on a less scale, among several Eastern nations. Egypt is the fertile source of this, as well as of almost every other description of knowledge; and the construction of stringed instruments, probably, originated in that inventive quarter of the world. Subsequent to the conquest of Egypt, two obelisks were brought to Rome by order of Augustus. By tradition, they were said to have been erected by Sesostris, about four hundred years previously to the siege of Troy. In the sacking of Rome, in the year 1527, one of these celebrated obelisks was thrown down and broken. It lies in the Campus Martius, under the name of the *guglia rotta*, or the *broken pillar*. There is distinctly represented on it, in basso relievo, the figure of a musical instrument *with a neck and two strings*. By tuning these strings fourths to each other, the tetrachord of four notes was produced; and if tuned by fifths, an exact diatonic octave of successive notes could, at once, be obtained. The moderns have doubled the number of strings, and have enlarged this instrument, seen on the obelisk of Heliopolis; and thus, at once, we have the source to

which the Violin, the Tenor, the Violoncello, the Double Bass, and such instruments, may be traced, without having recourse to more fanciful origins. The system of fingering, so amply detailed and exemplified in this work, is founded on just and simple principles, containing an easy and ready transition of the hand from one position to another, in every compass of the instrument. The examples might have been fingered, in many instances, in lower situations, or nearer the nut; but to this there will ever remain a standing objection, *viz.* the want of softness and sweetness of tone there, compared with the contrary effect, in positions somewhat higher on another string. The successive running of the notes being similar, as fully explained, the passage may be played with the same fingering, in general, in a lower position; *but the effect will not be adequate*, independent (particularly in slow movements) of introducing, frequently, the very fine *harmonics*, at the middle of the three back strings, which, with a little practice, can be readily *touched off*; also, in more rapid passages. If examples are found fingered differently from what appears in other works of repute, no disapprobation is intended; as the reasons, which it is trusted are well founded, are fully assigned.

The words *shift*, *back shift*, and *full shift*, are avoided in this work; as it appears that these expressions are perpetually liable to equivokes and mistakes on the part of the learner, and to much misunderstanding and trouble on that of the teacher. A *word* from the latter, is immediately followed by *instant* conception of meaning by the former; and thus, equally, in *alto*, in the *tenor*, and *lower compass*. The simplicity of this must appear quite obvious, when it is considered that there are *two* species of back shifts, *four* descriptions of half shifts, and *four* kinds of full shifts. We leave it to the reader to judge, how far the scholar must be embarrassed in referring, instantly, to the intended *shift*, under such an equivocal meaning.

The mode of giving the scales is intended to impress their relative characters strongly on the mind. *Each scale* rises by successive notes, and by the notes of the common chord, on two strings, and on one only; and descends to the fundamental note, by a closing chaunt. The scholar, or any player, may thereby readily habituate his ear to run a scale in ascent or descent, with accuracy of stopping, in any key or compass of the instrument. Any example, on any string, and in any position or compass, is equally illustrative of a different key in the same position, on contiguous strings, with precisely the same fingering; as is amply explained. This mode of giving the scales, by a *representative instance*, saved much exemplification.

The analyzation of the finger-board, by the projection of a *figure of its whole extent*, gives not only a complete view of the entire diatonic system of the instrument throughout, but elucidates the *harmonic* doctrine almost without any other explanation than mere inspection. The whole is apparent by a slight examination of *Fig. 1.* which has exactly the effect of what the French mean by the expressive phrase of, *sauter aux yeux*. This, however, was not alone trusted to; for a minute detailed account is given of the *harmonics*, and of their sameness, or correspondence throughout the entire extent of the Violoncello. Allowing for difference of size, and appellations of notes, the detailed explanation of the

finger-board, of the *harmonic* system, and of the notes, is also applicable to the Violin and Tenor; excepting that the *higher harmonics* cannot be brought out on these instruments. Fine *harmonics*, are too frequently omitted in playing, though those acquainted with their nature, and positions, well know how superior they are, in general, to the *same note* obtained by stopping, or pressure. In order to call the attention to the *harmonics*, they are notified by a *strong dot* placed to the left of the finger figured. The string meant is always indicated by the lowest figure under the relative notes; and the position, by the figure or notification under the fingering. One principle in fingering requires, in any system, a strict attention, because it is *founded in nature*. On account of the conformation of the hand, the fore-finger and middle finger open from each other with great facility; while, on the contrary, the third finger cannot, without great constraint, be extended above the distance of a semi-tone from the middle finger. On this account, the taking of a full note by the third finger, from the second supposed on the note below, is uniformly avoided. On this circumstance, principally, is established the doctrine of close and extended positions in the lower compass of the instrument. What is meant *only* holds while the thumb remains behind the neck: for if it is brought on the finger-board, in any situation, the unwillingness of the middle and third fingers to separate, no longer remains, and it (the third finger) may be extended with ease, as far as two notes, and more, from the situation of the middle finger. This shews how cautiously things should be disapproved of, without a thorough examination of the principle on which the *rationale* of the thing may be founded.

The short account of common practices, and musical terms given, is inserted, merely because the omission would be a chasm or defect, thus avoided. Errors have been guarded against. If any may have inadvertently crept in, the liberal-minded will readily make a due allowance for such casual circumstance, liable to happen in works of this didactic description, more than in other cases of a less complex character.

The sketch drawn up on the leading elementary principles of Music, is only addressed to those whose avocations and habits have been such, that no time could be afforded for this study. It may stimulate others to a farther pursuit of the subject.

The writer of these sheets has read much of what is printed on the subject of Music in general. How far he may have benefited by the perusal of a multiplicity of authors, he will not presume to decide. One thing he finds little hesitation in advancing; which is, that much as may be understood on the subject of *harmonics*, much more evidently remains to be demonstrated. Discoveries in science ought to be claimed with much caution; more especially when it is a recorded fact, that philosophers in different countries, at nearly the same period, have made the same discoveries, involving similar scientific improvements.

It has been long known, that if a string, in vibration, should be lightly touched (we have found the touch by the smallest point sufficient) at certain aliquot points of division of the string, such string will immediately divide itself into vibrations corresponding with the point so touched. The half, or third, of the string has been generally thus experimented on. In these cases, a *harmonic* sound is heard; that of the octave, when the middle of

the string is touched; and that of the twelfth major, when the third part from either end is touched lightly.

A *harmonic* is produced by touching lightly, at *any* aliquot division or point marked off *harmonically* in *Fig. 1*. It has been hitherto an unsatisfactory conjecture, or rather an absolute uncertainty, what action the whole of the lower part of a string may be in, while the upper small portion is vibrating any certain *harmonic*; such, for instance, as the nineteenth major, given *harmonically*, by one sixth part of the string from the bridge. It is with deference presumed, that the series of new experiments related in this work, *completely ascertains the action throughout the whole length of the string*: or, in other words, that *each aliquot part is, at the same time, sounding one and the same harmonic*, while the intermediate points remain *at rest*, and are bridges, over which the concatenated general and divided vibration is conveyed from one division of the string to another. The experiments detailed *prove* this curious, and, it is presumed, additional, and very interesting fact, which tends to account, in a great measure, for the whole doctrine of *harmonics*.

To the practical player on the Violoncello, and not to those deeply skilled in the science of Music, this work is addressed. With those who, on a perusal of the work, derive no degree of information from it, we should be glad to communicate, for the sake of farther insight on so interesting a subject: and with due deference we address to those the words of a favourite poet: "*Si quid novisti rectius istis, candidus imperti.*"