A SHORT HISTORY OF KEY NOISE AT THE PIANO: ITS TECHNICAL AND AESTHETIC IMPLICATIONS

There are few issues which can provoke more fevered reactions amongst pianophiles than that of 'tone' at the piano. Whether or not differences of timbre are a reality or an illusion has been the subject of quite some debate, especially during the last century. At the heart lies a fundamental question: is it possible to vary the timbre of a single note on the piano, independently of dynamics? Now, of course a very large amount of pianistic repertoire consists not of single notes but lines, chords, polyphony, textures achieved through superimposed layers and so on. In these cases, all sorts of issues of voicing, legato, articulation, pedalling, agogics, micro dynamic variation, and of course specific instruments and hall acoustics, come into play in producing timbral possibilities, not to mention further parameters when the piano playing is recorded.

But those of us who play some serial or other pointillistic music are perhaps more familiar with isolated notes than others (though notes in relative isolation do also play something of a part in some earlier repertoire), so for the purposes of this paper I want to stick to that fundamental question. I will first give an overview of how the subject and perceptions thereof informed a range of nineteenth- and twentieth-century piano treatises, then consider some more scientifically-oriented writings on the subject, leading to a consideration of how I have absorbed this issue in the context of my own playing, and also an overview of some contemporary works which have foregrounded this parameter.

1820s Pianists

A variety of nineteenth-century treatises and other accounts of piano playing certainly suggest a fair degree of agreement that timbral variation is indeed a possibility.
In Johann Nepomuk Hummel's *Ausführliche theoretisch-practische Anweisung zum Piano-Forte Spiel* (1827), Hummel wrote of the importance of ‘singing, softness and tranquillity’ in *Adagio* sections, whereby ‘the tones must persist, endure and be bound together, and made to sing through well-calibrated pressure’, which was brought about by 'fine touch of the fingers', together with legato playing. Hummel taught a technique involving high fingers which should not stay on the keys longer than necessary, so as to maintain clarity, with immobile arms and elbows close to the body. Thus it would appear that timbre was for him really an issue of *articulation,* with a clear ‘singing’ tone produced by differentiation of individual notes with selective use of legato.

Four years later, Frédéric Kalkbrenner, in his *Méthode pour apprendre le piano-forte à l’aide du guide-mains*, op. 108 (1831), wrote that the piano was ‘of all instruments, the one whose sound can be most varied’. Kalkbrenner warned against playing either with straight or overly-angled fingers, saying instead that ‘One must strike the note with the flesh of the fingers; for which the hand takes the most natural position; the arm stays perfectly still whilst the fingers make the action; the movement of the fingers consists only of the phalanx attached to the hand. This is the most essential

component of the mechanism, upon which depends the sound of the piano, but yet is that to which pianists attach least importance. The manner of striking the note should be infinitely varied, in line with the different sentiments to be expressed, sometimes with a caressing touch, sometimes in a precipitatory fashion like a lion seizing its prey. However, in order to draw the sound the instrument can give, one should be careful not to strike it too violently, for one must play the piano and not be a boxer.' This view would appear to be somewhat at odds with that of Hummel, whose technique would indeed suggest 'straight or overly-angled fingers', and also suggests that the finger acts as if in direct contact with the string, a position which would later inform the teaching and theories of Josef Lhevinne.

The playing of John Field, as recounted through various Russian critics and pianists who knew him such as Vladimir Odoyevsky, was said to be characterised by an emphasis upon colour as well as a lightness of touch,[1] though others described his touch as strong and brilliant.[2] The other major pianist of the 1820s, Ignaz Moscheles, was said to play with an 'astonishingly round and full' tone, whilst using only fingers for single notes;[3] his bravura effects were contrasted with the pearl-like sounds of Hummel, with both pianists having their own 'camps' of followers.[4] Moscheles expressed in 1822 an admiration for the 'fuller tone and better sonority' of Broadwood's pianos with metal plates for the legato approach of Johann Baptist Cramer, with whom he was performing at the time, but himself preferred the 'greater flexibility of Clementi's repeated mechanism' in order to play repeated notes, jumps and intervals, and also found the touch of the new Érard pianos to be too heavy, but changed his mind with their adoption of a double-escapement action.[5]
François-Joseph Fétis wrote, in the treatise on piano playing co-authored with Moscheles, noted the latter's use of a stiff wrist when playing passages in sixths and octaves (contrasted with the loose approach of Kalkbrenner) and wrote the following:

The smooth, equal, and polished styles of Clementi and Cramer, are remarkable for great mechanical correctness and graceful facility. In their schools, all is beautiful, pure, and regular. They admit no such artificial modes of *producing tone*, as may be observed in the school of Hummel, and still more in that of Moscheles. The latter has several different modes of attacking the keys, according to the effect he wishes to produce; and it is universally allowed that he does not resort in vain to the use of these ingenious contrivances of art peculiar to himself, his style being alike remarkable for variety and brilliancy.

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[1] James Stuart Campbell, *V.F. Odoyevsky and the Formation of Russian Musical Taste in the Nineteenth Century* (New York & London: Garland Publishing, 1989), p. 253.
[2] Patrick Piggott, *The Life and Music of John Field, 1782-1837: Creator of the Nocturne* (London: Faber & Faber, 1973), pp. 60-61.
[3] W.F. Pecher, 'The Emotional Legacy of the Classical School: Reminiscences of the Teaching of Moscheles', in *The International Library of Music for Home and Studio*, Vol. III (New York: The University Society, 1948), pp. 28-30, cited in Reginald W. Gerig, *Famous Pianists and their Technique* (Newton Abbot: David & Charles, 1976), p. 137.
[4] Emil F. Smidak, *Isaak-Ignaz Moscheles: The Life of the Composer and his Encounters with Beethoven, Liszt, Chopin and Mendelssohn* (Aldershot, Scolar Press, 1988), p. 17.
[5] Ibid. pp. 26-7, 83. Moscheles was unhappy about being accused of roughness by Lady Northland when playing her piano and claimed 'I despise nothing more than bashing into a piano' (ibid. p. 30).

So, at least according to Fétis's account, the idea of the mode of attack of the keys producing a palpable change in timbre was an important factor in the playing of Moscheles, though much less so in the distinct styles of Clementi and Cramer.

1830s Pianists

Fréderic Chopin, who admired both Field and Kalkbrenner, also believed that it was possible to achieve variety of sound at the keyboard, writing in his sketch for a piano method of the importance of positioning the hand with relation to the keys to obtain the most beautiful quality, and also preserving the individual qualities of each finger (rather than attempting to equalise them).[6] The Princess Marcelina Czartoysaka recalled how Chopin, as well as prioritising legato playing in the manner of Cramer and Clementi, thought the pianist should grip the keys and modify the weight of the fingers, whilst staccato playing should be like a violin pizzicato.[7] Notoriously, Chopin spoke about how 'When I am not in my best form, I prefer Érard's piano where I can easily find a ready-made piano tone. But when I am in a good mood and strong enough to find my own piano tone, I prefer one of Pleyel's pianos'.[8] This shows that at least on a Pleyel instrument, Chopin did believe that variety of tone was possible.

The playing of Sigismond Thalberg, who had studied with Kalkbrenner, was also noted by many for its *vocality*, its singing qualities, in a manner which was likely to have been considerably less subtle than that of Chopin, entailing stark foregrounding of a melodic line of all others, without many possibilities of more intricate counterpoint (not that his own music really demands that in the way that is true of that of Chopin).[9] Henri Blanchard wrote of how, when Thalberg played, one would 'forget the dryness of this mechanical instrument' and instead 'hear the sound held, singing, crying like Grisi, Malibran, de-Beriot, or Rubini',[10] which was in strong contrast to reports of Thalberg's arch-rival Liszt from the same time.[11] One critique of Liszt said that 'Liszt has no touch, but he makes the tones awaken, live grow, and soar through a subtle handling of the keys',[12] whilst Henry Chorley, in an otherwise adulatory

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[6] Frédéric Chopin, *Projet de Méthode*, in Jean-Jacques Eigeldinger, *Chopin: Pianist and Teacher as seen by his pupils*, translated Naomi Shohet, with Krysia Osostowicz and Roy Howat, edited Roy Howat (Cambridge: Cambridge University Press, 1986), pp. 23, 25, 32-33, 40-41, and also the recollections of Jan Kleczyński, Karol Mikuli and a Madame Courty, ibid. pp. 39-40, 47; see also Charles Rosen, *The Romantic Generation* (London: Fontana, 1999), pp. 366-8.

[7] See the accounts of Princess Marcelina Czartoyska, Georges Mathias, Kleczyński and Mikuli, in Eigeldinger, *Chopin*, pp. 31-2.

[8] As related by Maurycy Karasowski, in Eigeldinger, *Chopin*, p. 26. On the opposition between Érard and Pleyel as portrayed in the French press in the 1830s, see Jean-Jacques Eigeldinger, 'Chopin et la Manufacture Pleyel', in Eigeldinger (ed), *Frédéric Chopin. Interprétations* (Geneva: Librarie Droz SA, 2005), pp. 101-2. Érard pianos were associated with Liszt, and Pleyels with Kalkbrenner, Chopin, and Ferdinand Hiller.

[9] See Gooley, *The Virtuoso Liszt*, pp. 24-7, 48; and Kenneth Hamilton, *After the Golden Age: Romantic Pianism and Modern Performance* (Oxford: Oxford University Press, 2008), p. 18.

[10] Henri Blanchard, writing in *Revue et Gazette musicale* 3/19 (8 May 1836), pp. 153-4, cited in Dana Gooley, *The Virtuoso Liszt* (Cambridge: Cambridge University Press, 2004), pp. 26-7.

[11] Gooley, *The Virtuoso Liszt*, pp. 27-8. The differences between the playing of Thalberg and Liszt might in this sense be compared to the different operatic idioms of Bellini and Donizetti respectively, though Liszt was much more drawn to the earlier idiom of Rossini than either of these figures, at least as evidenced through his correspondence from the 1830s, to be found in Franz Liszt, *An Artist's Journey: Lettres d'un bachelier ès musique 1835-1841*, edited and annotated Charles Suttoni (Chicago & London: University of Chicago Press, 1989).

[12] *Pester Tageblatt*, 31 December 1839, cited in Gooley, *The Virtuoso Liszt*, p. 28.

account, wrote that 'In uniform richness and sweetness of tone he [Liszt] may have been surpassed'[13]. An article by Joseph Fischof in the *Neue Zeitschrift für Musik* in 1838 also ranked Liszt relatively low on beauty of touch.[14]

Thalberg's set of stylistic principles as laid down in the preface to his series of transcriptions *L'art du chant appliqué au piano*, op. 70, published in the 1850s and 1860s, include (a) keeping the fingers close to the keys in order to produce a full sonority; (b) always separating the melody clearly from the accompaniment (and learning from singers[15]), and using close arpeggios for melodies in the upper notes of chords; (c) playing the right hand slightly after the left when the former has the melody, but never exaggerating this, only with the shortest of delays; (d) holding notes for maximum legato; (e) much variety of dynamics, colour and sonority; and (f) using pedal (either one or both) at all times. Taken as a whole, these attributes constitute what would today be called a 'beautiful tone' approach to the instrument[16], which I would say can be heard in particular in the playing of a variety of recorded Russian performers, from Samuel Feinberg and Vladimir Sofronitsky to Boris Berezovsky and Evgeny Kissin[17]. In contrast, Liszt's style was perceived as more orchestral, entailing a wide range of sonorities resembling those of other instruments, though again this may have been in some measure down to the nature of his own writing for the piano. The other major pianist of the 1830s, Adolph von Henselt, appears to have played in a style closer to that of Thalberg and perhaps Chopin, with one St Petersburg critic describing how 'in his hands, it [the piano] becomes a new singing instrument';[18] Wilhelm von Lenz wrote of after hearing Henselt's St Petersburg debut in 1938 of his 'rich fullness of tone in *pianissimo*' which 'had never before been heard on the piano!',[19] a view similar to that given later by La Mara.[20]

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[13] Henry Fothergill Chorley, *Music and Manners in France and Germany* (London: Longman, 1841) volume 3, p. 45.

[14] Josef Fischof, in *Neue Zeitschrift für Musik* 8, No. 34 (April 27, 1838), summarised in Christopher Gibbs, '"Just Two Words. Enormous Success": Liszt's 1838 Vienna Concerts', in Christopher Gibbs and Dana Gooley (eds), *Franz Liszt and His World* (Princeton & Oxford: Princeton University Press, 2006), p. 203.

[15] Thalberg himself studied voice for five years with Manuel Garcia. See Ian G. Hominick, 'Sigismond Thalberg (1812-1871), Forgotten Piano Virtuoso: His Career and Musical Contributions (DMA dissertation: Ohio State University, 1991), p. 50.

[16] The style of playing that is often characterised as exhibiting a 'beautiful tone' is the product of a particular set of stylistic practices like these mentioned. This is explored in Charles Rosen, *Piano Notes: The Hidden World of the Pianist* (London: Allen Lane, 2003), pp. 23-30, and Ian Pace, 'Meta-Piano: The Dialectics of Piano Playing' (programme note for concert in King's College, London, February 26, 2001, partly reproduced at http://www.musicweb.uk.net/sandh/2001/Mar01/metapiano.htm (accessed 21/4/09).

[17] There may be interesting research to be conducted on the history of an 'aristocratic' singing style at the piano emanating from Thalberg, drawing upon the social foundations of such a style as traced by Gooley. Most of Thalberg's pupils did not become especially prominent either as performers or teachers, except perhaps for Camille Pleyel and Arabella Goddard; his influence upon other pianists around him probably accounts better for the development of this style. See Hominick, 'Sigismond Thalberg', pp. 93-5 for an overview of Thalberg's students.

[18] *Sanktpeterbugskie vedomosti* 111, No. 294 (31 December 1838), p. 336. cited in Natail Keil-Senserowa, 'Leben und Wirken Adolph Henselts in Russland. Ergebnisse neuer Quellenfunde', in Lucian Schiwietz (ed), *Adolph Henselt und der musikkulturelle Dialog zwischen dem westlichen und östlichen Europa im 19. Jahrhundert* (Sinzig: studio verlag, 2004), p. 142. In his first Russian concerts, Henselt played works of Beethoven, Moscheles, Chopin, and original works and transcriptions of Liszt, as well as his own music (ibid. p. 144).

[19] Wilhelm von Lenz, *Great Piano Virtuosos of Our Time From Personal Acquaintance: Liszt, Chopin, Tausig, Henselt*, translated Madeleine R. Baker (New York: Schirmer, 1889), p. 128.

Pianists of the second half of the nineteenth century

Writing on the pianist Anton Rubinstein, Konstantin Igmunov noticed that the shortness of his fingers would have made a high wrist very difficult to maintain. Igmunov also drew attention to a particular hand position derived from Villoing's teaching, 'with the joint between the tip and middle phalanx of the finger pressed in'[21]. The Russian critic Levensohn claimed that Rubinstein played the Schubert-Liszt *Erlkönig* with curved middle fingers and a high wrist, 'so that the fingers that play the octaves instead of falling sideways on the keys strike with their tips as with a hammer', which he contrasted with an apparently more normative method of using a light wrist and extended middle fingers.[22] James Huneker, who would have heard him in later life, wrote endlessly about Rubinstein's tone, citing his performances in his prefaces to Schirmer's editions of Chopin, though he was unable to identify the means of creating such a sound.[23] Some Parisian critics, however, felt that Rubinstein's tone was too rich and full when he played Chopin.[24]

Anton Rubinstein's brother Nikolai, according to one account, insisted upon straight fingers and a high wrist, and was said to 'produce sounds of terrible force'[25]. Liszt himself found a performance by Nikolai of the *Totentanz* to be astounding, especially from the macabre qualities he achieved through 'a touch which might well have come from a finger with no flesh on it'.[26]

During the second half of the nineteenth century, the so-called *style severe* – entailing high fingers, strict rhythm and tempo and an essentially thin and non legato touch, remained dominant in Paris, especially as few foreign pianists settled in the city when it became no longer the dominant musical centre of Europe.[27] The primary pedagogical exponent was Antoine-Françoise Marmontel (1816-1898), who became head of piano at the Conservatoire in 1848.[28] The most prodigious French pianist to come to prominence during this period was Camille Saint-Saëns (1835-1921), who had studied with Kalkbrenner's student Camille Stamaty. Both Saint-Saëns' playing and teaching stressed the use of the fingers rather than the arm, brilliance, clarity and evenness; Clara Schumann was highly critical, saying that 'even technically he is only a circus rider, offering not a single instance of tonal beauty. . . This really ceases to be piano playing and becomes a tightrope walking act'[29]. In Stuttgart, Sigismund Lebert

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[20] La Mara, 'In Memory of Adolf von Henselt', originally in the *Leipziger Zeitung*, reproduced in Bettina Walker, *My Musical Experiences*, new edition (London: Richard Bentley & Son, 1892), pp. 280-81.
[21] Konstantin Igmunov, 'Some Technical Observations', in Christopher Barnes (trans. & ed), *The Russian Piano School: Russian Pianists & Moscow Conservatoire Professors on the Art of the Piano* (London: Kahn & Averill, 2007), pp. 79-80. Igmunov derives this information on Nikolai from 'One old lady who used to study with Nikolai Rubinstein'.
[22] 'Rubinstein as Pianist', in Rubinstein, *Autobiography*, p. 170).
[23] Bowen, *Free Artist*, pp. 127-128.
[24] Bowen, *Free Artist*, p. 295.
[25] Poznansky, *Tchaikovsky*, p. 86.
[26] Need to find what the source was for this. Bowen?
[27] Timbrell, *French Pianism*, pp. 46-47.
[28] On Marmontel's obtaining this position instead of Alkan, see William Alexander Eddie, *Charles Valentin Alkan: His Life and His Music* (Aldershot: Ashgate, 2007), pp. 10-11.
[29] Ibid. p. 61.

and Ludwig Stark, who published their *Grosse Klavierschule* in 1858,[30] represented a throwback from the tendency from the 1830s onwards to integrate the fingers with the arm, returning to strict (and tortuous) finger exercises with the arm held fixed and close to the body; this type of method became popular in many other German conservatories.

Clara Schumann herself, who became head of piano at the *Hoch-Konservatorium* in Frankfurt in 1878 urged her students to strive for a quasi-orchestral range of sonorities (here demonstrating her Beethovenian lineage, one thing she did share with Liszt), with arms hanging freely rather than pressed in, and a loose wrist;[31] she disapproved of the Lebert-Stark school of technique and would not take students from Stuttgart.[32] Ludwig Deppe (1828-1890), whose methods have been recounted by his students Amy Fay and Elizabeth Caland, went further in breaking with the older schools and certainly the Stuttgart tradition, advocating a integration of the finger, hand, forearm and upper arm, known as 'muscular synergy'; Caland wrote of how use of the finger alone would produce just a small and weak tone, which would be deepened by the employment of the rest of the apparatus.[33]

One can find other variants of these approaches in the work of other leading pianists and pedagogues of this period. Theodor Leschetizky, who laid the foundations of a Russian piano school distinct from that of Anton Rubinstein, emphasised a quiet demeanour, cantabile playing, a mixture of curved fingers and some wrist motion, chords played close to the keys.[34] Marie Jaëll, in her 1897 *Le mécanisme du toucher*, attempted a more scientific approach, but ended up with a view which resembled that of Kalkbrenner before her and Lhevinne later.

> The more the region of higher irritability comes into contact with the key, the more intense the tone generated. The more the less stimulus-sensitive region in contact with the key, the softer the tone.[35] [Come back to this if time]

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[30] Sigmund Lebert and Ludwig Stark, *Gross theoretische-praktische Klavierschule ... mit Beiträgen von Benedikt, Herzog, F. Hiller, Krüger, F. Lachner, I. Lachner, Moscheles & Speidel*. four volumes (Stuttgart: Cotta, 1858); English edition *Grand Theoretical and Practical Piano School for Systematic Instruction in All Branches of Piano Playing from the First Elements to the Highest Perfection*, translated from the fifth German edition (1870) by C. E. R. Muller (New York; White-Smith Music Publishing Co, undated).

[31] Nancy Reich, *Clara Schumann:The Artist and the Woman*, revised edition (Ithaca, NY and London: Cornell University Press, 2001), pp. 286-288

[32] Monica Steegmann, *Clara Schumann* (London: Haus Publishing, 2004), p. 122.

[33] See Elizabeth Caland, *Artistic Piano-Playing as Taught by Ludwig Deppe, together with Practical Advice on Questions of Technic*, translated Evelyn Sutherland Stevenson (Nashville: Olympian Publishing Company, 1903); Amy Fay, *Music-Study in Germany* (1880), with introduction by Frances Dillon (New York: Dover, 1965), pp. 285-91; and most of Deppe's short 1885 article entitled 'Armleiden des Klavierspielers', as reproduced in Gerig, *Famous Pianists*, pp. 252-4.

[34] The primary treatise is Malwine Brée, *The Leschetizky Method: A Guide to Fine and Correct Piano Playing* (1902), translated Arthur Elson with introduction by Seymour Bernstein (New York: Dover, 1997); see also Marie Prentner, *Leschetizky's Fundamental Principles of Piano Technique* (1903) (New York: Dover, 2005), bi-lingual edition (English and German); for more general accounts, see Hamilton, *After the Golden Age*, pp. 152-4 and Ethel Newcomb, *Leschetizky as I Knew Him* (New York & London: D. Appleton & Co, 1921),

[35] Marie Jaëll, *Le mécanisme du toucher* (Paris: Armand Colin et Cie, 1897) [find page numbers]. [Also reference Guichard's book]

Another writer who tried to theorise touch was Tobias Matthay, in his rather convoluted book *The Act of Touch* (London, 1903). Matthay recognised various aspects of the nature of the instrument, but made the odd argument that:

> f): The greater the tonal speed we induce during each individual key-descent, the greater is the tone-*quantity*.
> g): The more *gradually* this key-speed is attained, the more beautiful is the Tone-*character*, - the fuller, more "sympathetic," singing and carrying is its quality, and the finer the control.
> h): The more *sudden* the key-depression, the harsher is the resulting Tone-quality; it may be more "brilliant," but it will be less effective in carrying power.[36]

Drawing upon Helmholz, but hardly writing in a scientific fashion, Matthay argued that one could produce differentiation of tone within a uniform dynamic, based upon this varying of how the key speed was achieved. At the same time he warned against hitting the keys or applying pressure to the bed.

Then in 1905 Rudolf Breithaupt, the founder of so-called 'weight' technique, in which the fingers are used to support the weight of the arm, published his *Die natürliche Klaviertechnik*. The technique he outlined would find advocacy amongst the likes of the Venezuelan pianist Teresa Carreño (1853-1917) and later Claudio Arrau (1903-1991), as well as later pianists taught or inspired by Arrau including Garrick Ohlsson or Robert Szidon. Breithaupt argued that:

> Only the greatest elasticity employed with deep pressure creates the true singing tone. This deep pressure is a product not only of true stress from the back, but also sympathy from the whole upper body. This even affects the stomach muscles and those of the thigh. [37]

Breithaupt believed that one should play with an upright torsos and arched thorax so that the whole upper body leans forward and rests into the instrument, in order to produce this type of sound.

But the text above all which changed this view was Eugen Tetzel's *Das Problem der modernen Klaviertechnik* (Leipzig: Breitkopf & Härtel, 1909).[38] Tetzel looked at the working of the modern piano employing Erard's double-escapement action, and pointed out what should have been relatively self-evident – when the hammer hits the string, the only parameter of it which can be affected is its speed (it is no longer in contact with anything operated with the finger – the only force in operation is gravity retarding its speed). Whilst the properties of the hammer head itself would certainly affect the timbre, this cannot be controlled by the player at the moment of performance. Tetzel found three major physicists prepared to back his conclusions – Heinrich Rubens, Max Planck and Otto Krigar-Menzel. Thus a good deal of what is referred to as a pianist's tone was an illusion, and really indicated other aspects of the

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[36] Tobias Matthay, *The Act of Touch in all its Diversity* (London: Bosworth, 1903), pp. 48-9.
[37] Rudolf Breithaupt, *Die natürliche Klaviertechnik: die freie, rhythmisch-natürliche Bewegung (Automatik) des gesamten Spielorganismus (Schulter, Arme, Hände, Finger) als Grundlage der "klavieristischen" Technik* (Berlin: C.F. Kahnt, 1905), p. 250.
[38] Eugen Tetzel, *Das Problem der modernen Klaviertechnik* (Leipzig: Breitkopf & Härtel, 1909)

playing. Tetzel then went on to analyse various technical approaches of others, including F.A. Steinhausen, Tony Bandmann, Breithaupt, Matthay.

Tetzel's view was highly influential; amongst subsequent writings influenced by it were Leonid Kreutzer's *Das Wesen der Klaviertechnik* (1923) and Otto Ortmann's *The Physical Basis of Piano Touch and Tone* (New York: E.P. Dutton, 1925). [Meyer]

In 1930, William Braid White, in a paper called 'The Human Element in Piano Tone Production' put the Matthay parameters to the test, recording and gauging the differences when a key is struck with constant, increasing or decreasing velocity, and concluding like Tetzel that 'there is no change of loudness without a correspondence change of color' and similarly 'there is no change of color without change of loudness'. Then in 1934, three engineers in Pennsylvania – Harry C. Hart, Melville W. Fuller and Walter S. Lusby – set out to attempt a scientific means of testing my initial question. They recorded a hammer hitting a string on Steinway grand piano using a condenser microphone, amplifier and moving coil oscillograph placed in a separate room, and also made an optical recording of the motion of the hammer. Using several different people to strike the notes (including pianist Abram Chasins, Helen Diedrichs, a teacher of piano technique, and Hart (not a pianist) and Lusby themselves) all playing the same notes multiple times with radically different striking techniques. Their results backed up those the conclusions of Tetzel, Kreutzer, Ortmann, White and others – there was no perceptible difference in tone independently of volume; they concluded that what produces the distinctive sound of a pianist was the way they combined and graded tones relative to one another, using dynamics and agogics. Following this study, more writers, including James Jeans (in his *Science & Music* (1937)), Alexander Wood (*The Physics of Music* (1943)) and Charles A. Culver (*Musical Acoustics* (1947)) all poured cold water on the notion that it was possible to vary tone independently of dynamics, regardless of what various pianists think.

But this view did not really catch on in much pedagogical literature, nor in other writings on the piano and pianists; many throughout the twentieth century continued to consist in the individuality of a pianist's tone, and an intimate relationship between the means of striking the key and the resultant timbre. To this day such a mode of discourse continues to permeate much writing of pianophiles. The point was put most emphatically by Josef Lhevinne, as mentioned earlier:

In days gone by there was an impression that a long, bony, fleshless hand, with hard fingertips, was a good pianistic hand. It may be for execution of florid passages and great velocity, but for the production of a good tone it can be extremely bad.

> [Anton] Rubinstein had a fat, pudgy hand, with fingers so broad at the fingertips that he often had difficulty in not striking two notes at one time. Indeed, as I have pointed out hitherto, many of the so-called mistakes that he made were due to this condition. On the other hand, his glorious tone was in no small measure due to this. Indeed, it may be said that the thicker the cushions of flesh upon the fingertips, the wider the range of variety of touch. Rubinstein, by means of an unearthly amount of work at the keyboard, was able to overcome technical obstacles and get the benefit of the responsive cushions he had at the ends of his fingers. This is merely a mechanical and acoustical principle. It is easy to

> distinguish when one listens to a metal xylophone. If the bars of the xylophone are struck with a hard metal rod, the tone is harsh and "metallic." Let them be struck with a rod with the end covered with soft felt and the tone is entirely different and beautifully musical. You may not think this applies to the tone of the pianoforte, but a little experimenting will soon show that it is the case. […]
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> In the previous section we have spoken of the part of the finger that comes in contact with the keys. If that part is well covered with cushions of flesh, the tone is likely to be far better than if it were hard and bony. Therefore, the main principle at the first is to see that the key is touched with as resilient a portion of the finger as possible, if a lovely, ringing, singing tone is desired instead of the hard, metallic one. What part of the fingertip is this? Certainly not the part immediately behind the fingernail. There the tone produced is still bony and unresponsive. Just a little farther back in the first joint of the finger you will notice that the cushion of flesh is apparently more elastic, less resisting, more springy. Strike the key with this portion of the finger, not on the fingertips as some of the older European methods suggested.[39]

One of the few exceptions is Charles Rosen, who in his *Piano Notes* (2002) argued that tone in this sense is an illusion, coming from broader aspects of playing rather than the nature of production of individual notes.

> In spite of the beliefs of generations of many thousands of piano teachers, there is no way of pushing down a key more gracefully that will make the slightest difference to the resulting sound. Inside the piano, the elaborate arrangements of joints and springs will only cause the hammer to hit the strings with greater or lesser force. […]
>
> There are indeed different kinds of tonal beauty in piano sound, and each pianist can develop a personal sonority that makes his or her work recognizable, but it does not come from the way any individual note is produced. A “singing” sound on the piano is not given by the instrument but by the way it is exploited with a specific musical phrase, and this exploitation is not mechanical and not a simple matter of technique: it requires at every moment a sense of the music. […] In performing a work on the piano, a beautiful quality of tone is achieved by shaping the melody and molding the harmony and the counterpoint. When that is done right – when the harmonies vibrate and the melody has a unified and convincing contour – the sound is beautiful.[40] (pp. 24-5)
>
> Playing with what is called a beautiful sound is supposed to be essential: what this generally means is by common consent restricted to a style of execution in which the melodic voice is set slightly in relief over the accompaniment, violently contrasting accents are avoided, and the pedal is used throughout but with discretion, avoiding any suggestion either of harmonic blur or of a dry sonority. This beautiful sound is international, although modified slightly in different national cultures. In much French pianism, for example, the melody is not quite so prominently set over the other voices as in the Viennese school: the latter style is

[39] Josef Lhevinne, *Basic Principles in Pianoforte Playing* (New York: Theodor Presser, 1924), pp. 14, 18.
[40] Charles Rosen, *Piano Notes: The Hidden World of the Pianist* (London: Allen Lane, 2003), pp. 24-5.

best characterized by Busoni's remark, "Any melody worth playing should be played *mezzo-forte*."[41]

My own teacher György Sándor had earlier, in a passage from his book *On Piano Playing* (1981) which speaks sarcastically of the attempts by scientific 'experts' to 'prove' that one cannot affect tone on the piano, conceded that for a single note, it may be the case that variation of tone independently of dynamics is not possible. This view was very strongly disputed by Boris Berman in his *Notes from the Pianist's Bench* (2000) where he maintained the important of the parameter of weight.

But one other writer had noticed a dimension which had eluded these piano theoreticians and scientists. This was Ludwig Riemann in his *Das Wesen des Klavierklanges und seine Beziehungen zum Anschlag* (Leipzig: Breitkopf & Härtel, 1911). Riemann is the first writer of which I am aware who drew attention, in the course of a complex book analysing every possible component of piano sound, to 'noise' elements, and in particular the sound of the finger, and by extension the rest of the body, upon the keys. He noticed in particular that this type of sound, which I will call 'key noise' was practically eliminated from those within the 'weight school', since the fingers tended to remain in intimate communion with the keys as they supported the weight of the arm.

A few writers picked up on Riemann's ideas; Ortmann mentioned the sound of the finger on the key as the only noise parameter the pianist could control, whilst Carl Adolf Martienssen, in his *Die individuelle Klaviertechnik auf der Grundlage des schöpferischen Klangwillens* (1930), used Riemann as a means of arguing against Tetzel. Then in 1935, Julius G. Baron and J. Hollo published an article in which they emphasised this parameter.[42] Báron wrote a letter to the *Journal of the Acoustical Society of America* in 1958 to emphasise further how audible are the extra 'noises' on the piano, a letter which would be later taken up by Geoffrey Payzant in his study *Glenn Gould: Music and Mind*

> It does not matter whether a key is depressed by the finger of Arthur Rubinstein or by the tip of his umbrella: only one variable is controlled by the piano key and the manner in which it is depressed, and that is the velocity of the hammer at the instant it strikes the string. There are not two or more different ways of travelling at the same velocity along the same arc, as the hammer must do.
>
> The velocity of the hammer, in its turn, controls *two* variables, but it controls neither independently of the other. These are loudness and tone-quality. For any given level of loudness there can be only one tone-quality, and any particular tone-quality can only be delivered at its precisely corresponding level of loudness. The same is not true of voice, strings or winds, on all of which some measure of independent control of either loudness or tone-quality is possible under normal conditions.[43]

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[41] Ibid. p. 189.
[42] Julius G. Baron and J. Hollo, 'Kann die Klangfarbe des Klaviers durch die Art des Anschlages beeinflusstwerden?', *Zeitschrift für Sinnesphysiologie* 66 (1935), pp. 23-32.
[43] Geoffrey Payzant, *Glenn Gould: Music and Mind* (Toronto and London: Van Nostrand Reinhold, 1978), p. 115.

Payzant is critical of Lhevinne, and compares piano to the fairground test where some hits a lever with a mallet, to flick a metal slider with enough force to hit a gong at the top.[44]

It was when I read Payzant's book as a student that I first began to think seriously about this aspect of piano playing.

Videos

Play Horowitz (end of Polonaise in A-flat op. 53),

Earl Wild. Liszt, *Un sospiro*. In an interview with David Dubal, Wild maintained that he never lost contact with the keys. Looking at various videos shows this to be a little of an exaggeration, but the basic principle is there.

Glenn Gould. Goldbergs in 1981, from about 2'30"

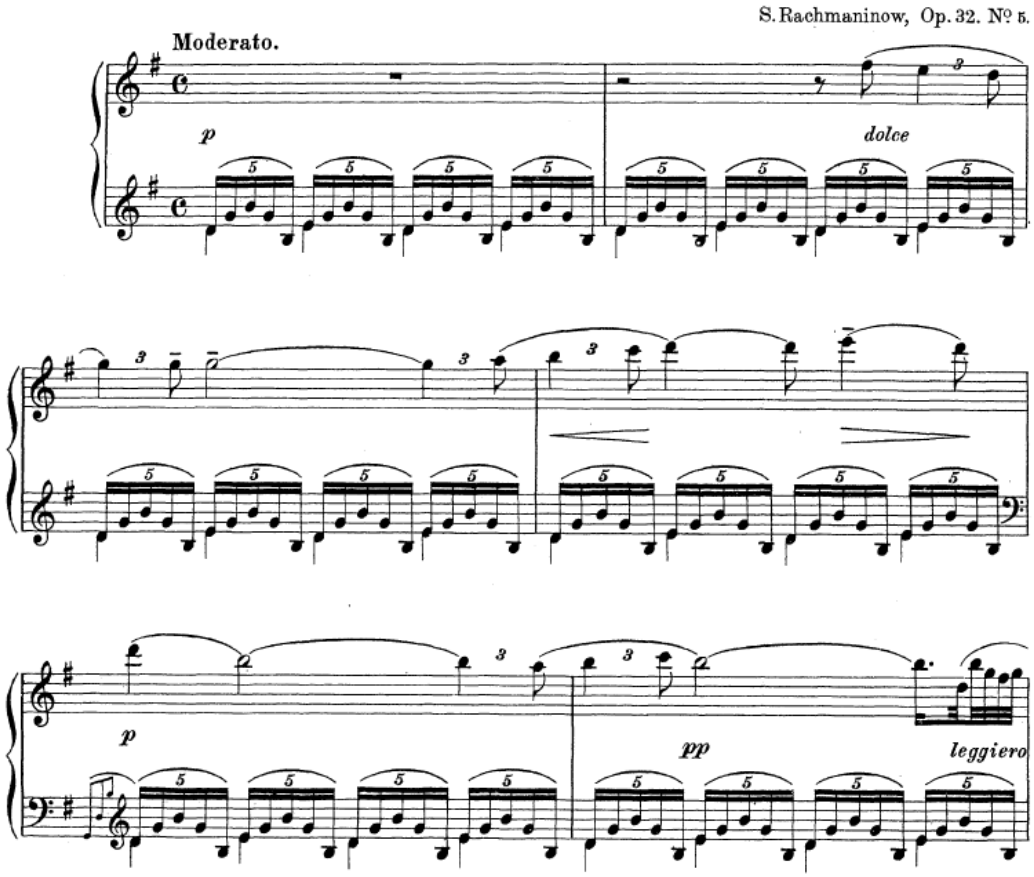
Pierre-Laurent Aimard, First Debussy Étude.

My Experiences

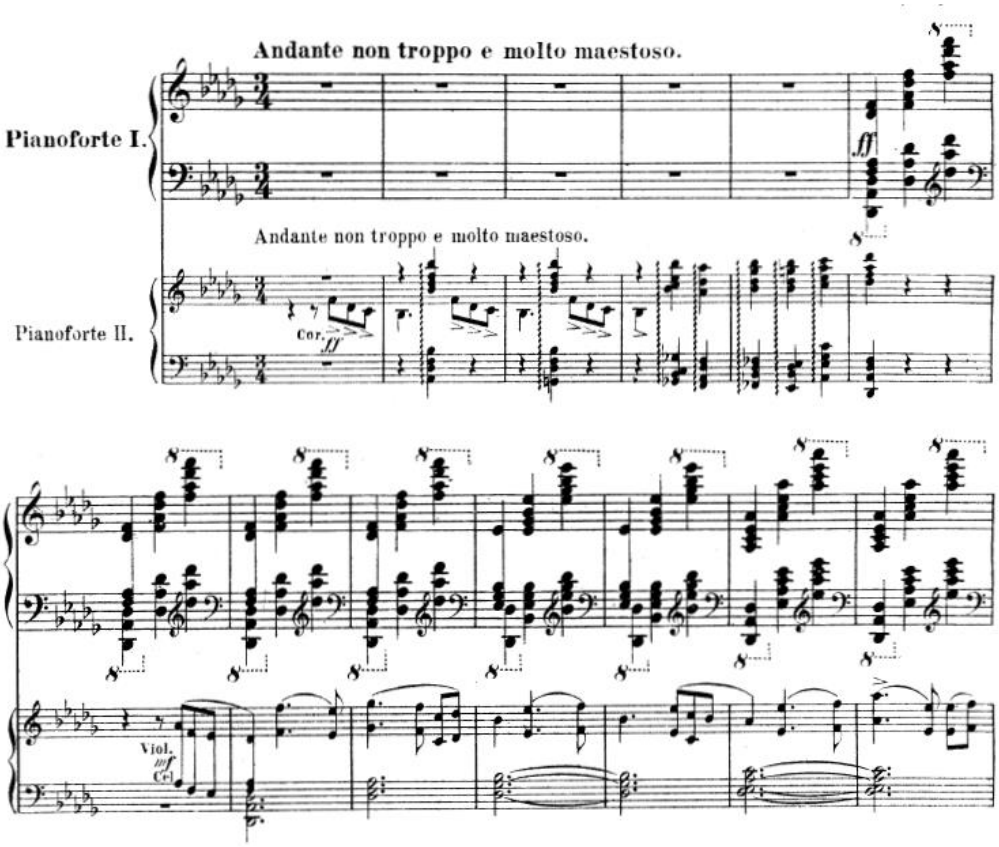
Study with Sándor

Attitude to the fingers – not gripping keys, but helping with wrist. At best this can make the key noise practically non-existent. Occasionally I may use an approach with the fingers much closer, even overlapping in where they are depressed, as for example with Rachmaninoff's G major prelude (play both ways).

[44] Ibid. pp. 116-17.

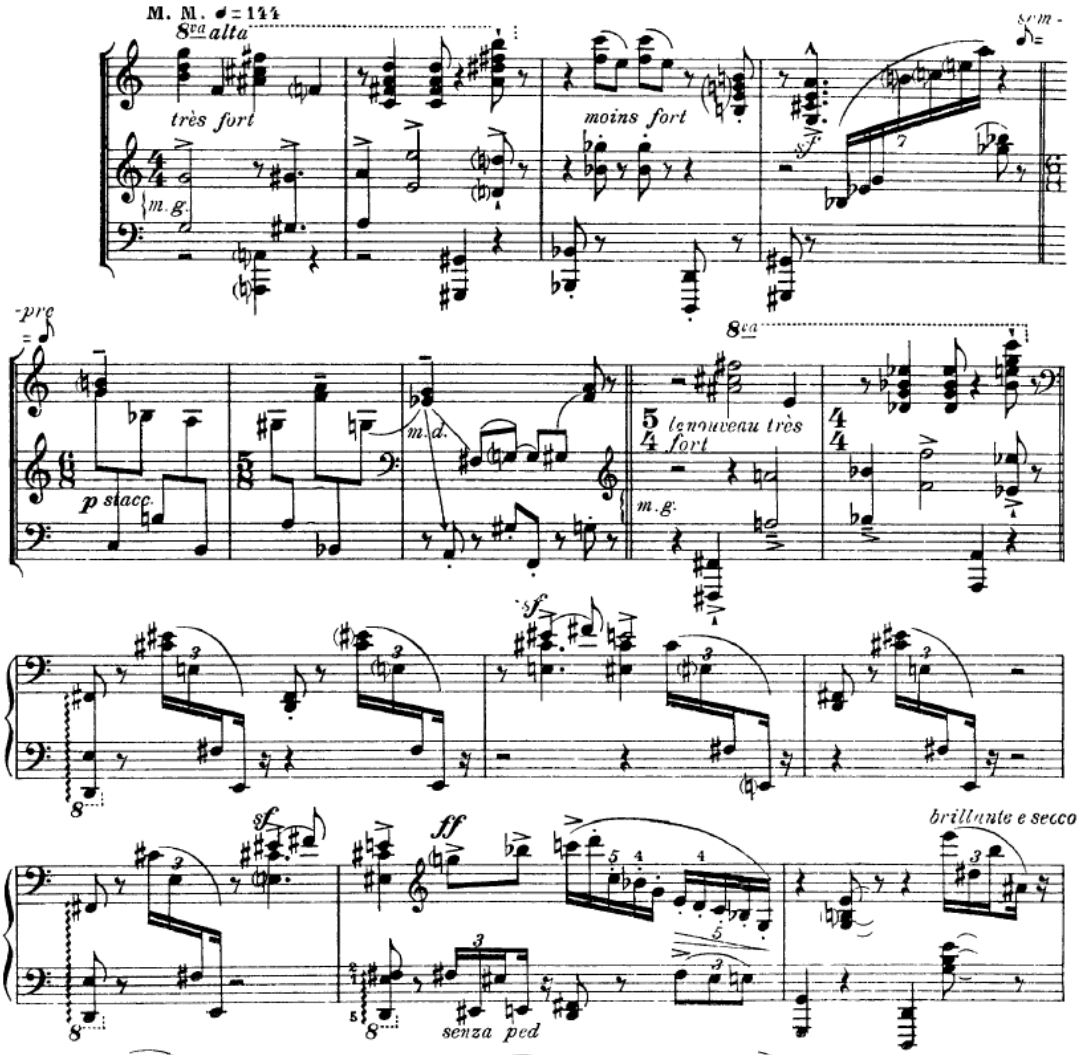


Free Fall and Thrust (describe both). Demonstrate with Chaikovsky, Piano Concerto No. 1

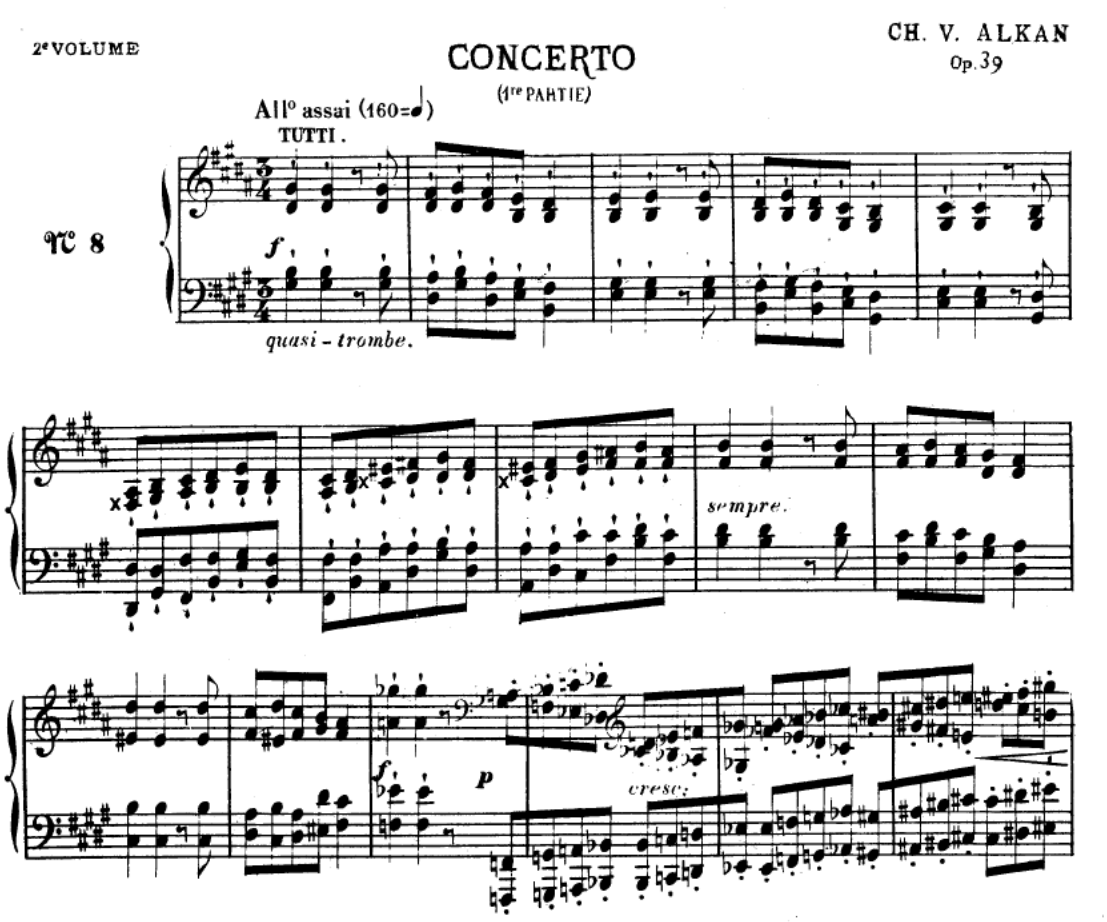


Sándor's Staccato technique entails a distribution of the motion between all four components of the performing mechanism – fingers, hand, forearm and upper arm – though the degree of each can be varied. Both the Free Fall and Staccato techniques, if used in certain ways, can produce varying amounts of key noise, which can be controlled.

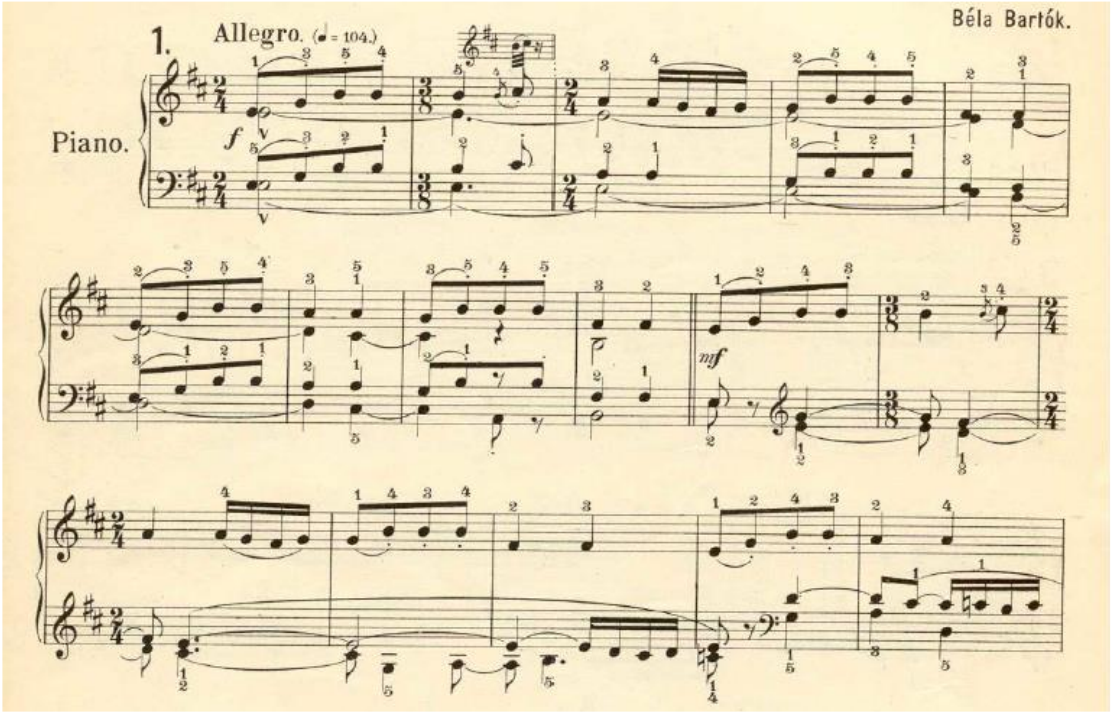
For me this is an asset when playing, say, the Stravinsky *Piano-Rag Music*.

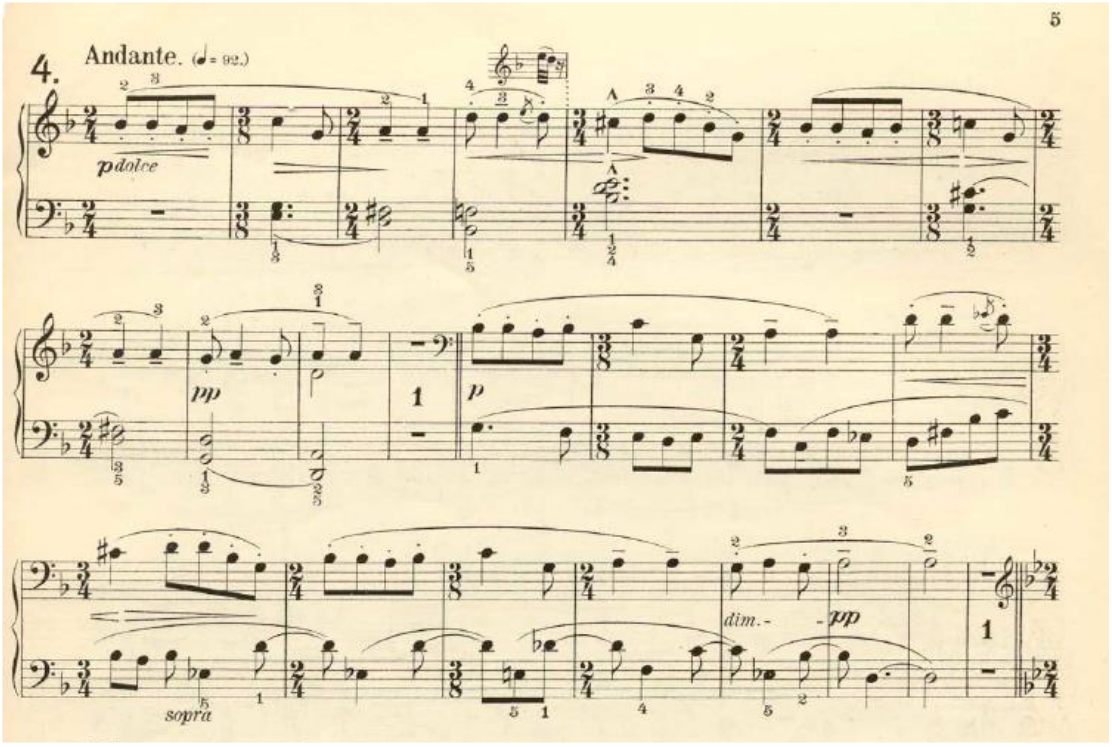


Or Alkan *Concerto for Piano.*



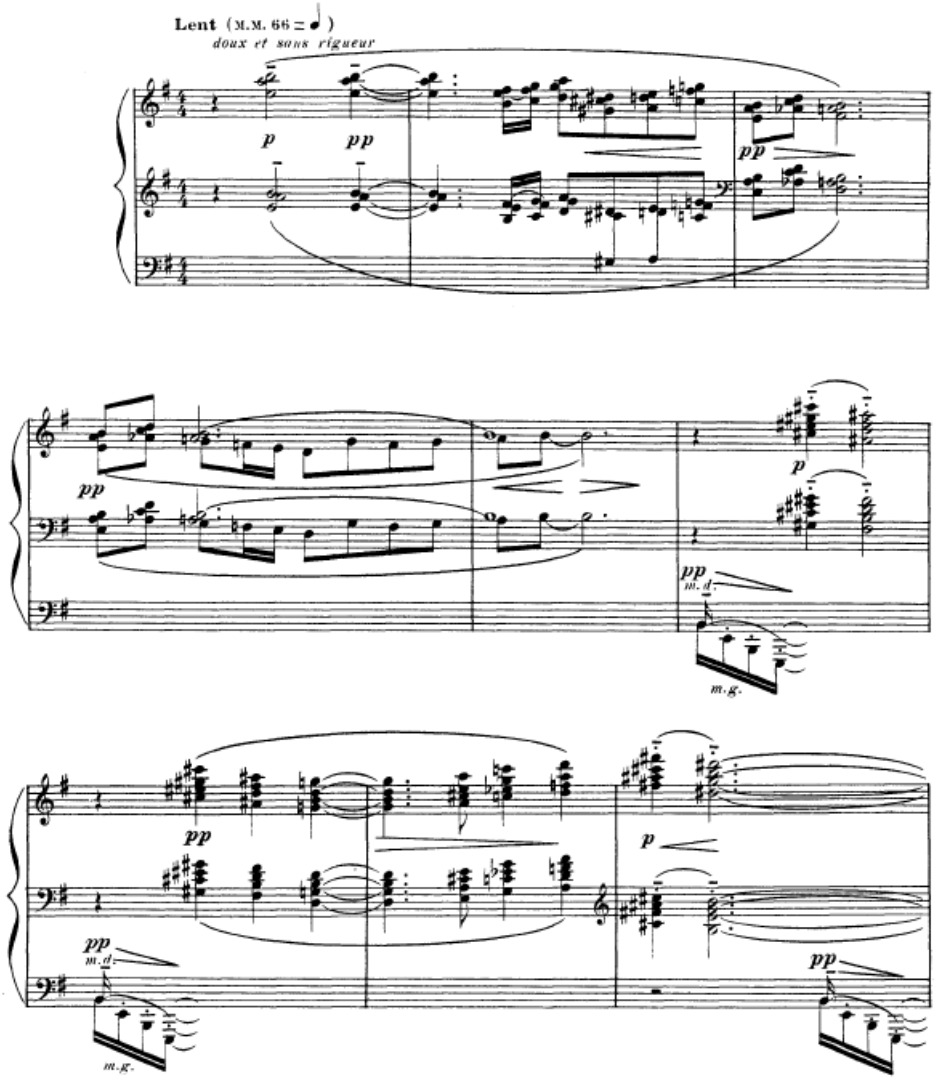
Or Bartók Romanian Christmas Carols, for clean and bright articulation.



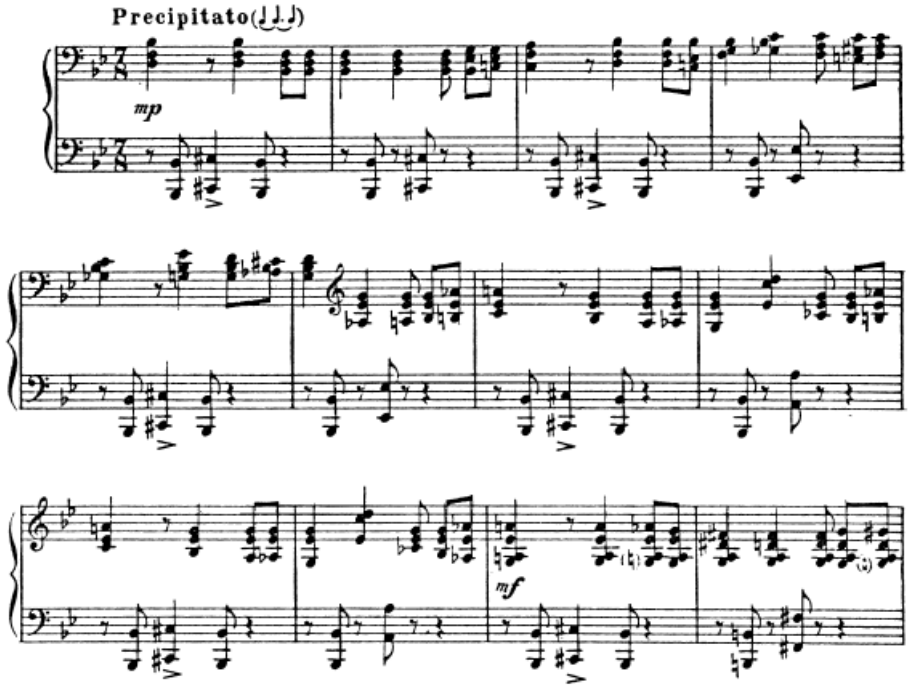


Possibly some Beethoven as well (op. 2 no. 1)

Then in ‘Et la lune descend sur le temple qui fut’, from Debussy *Images Book 2*, a differentiation between portato or legato chords is produced through key noise.



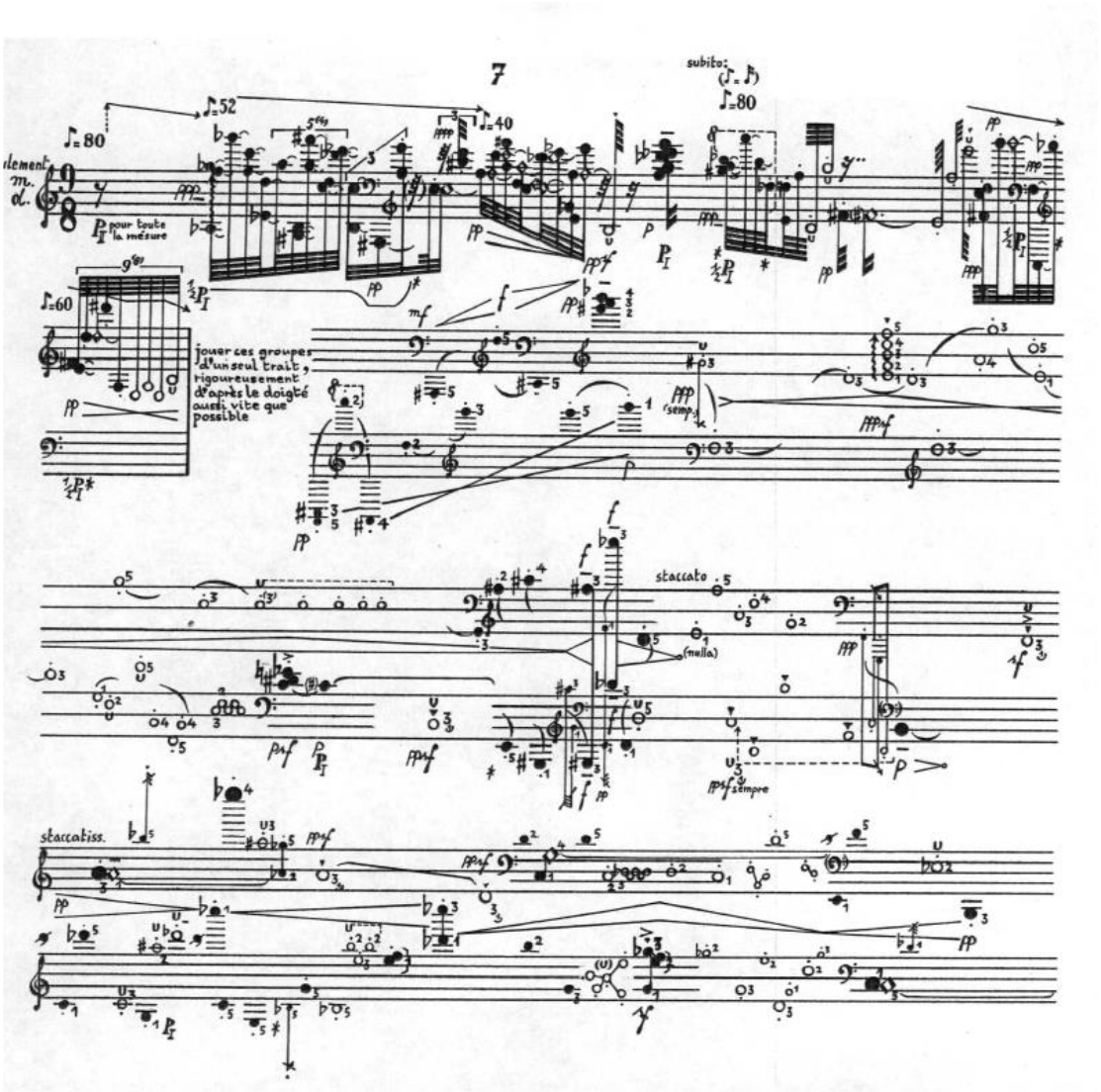
On the other hand, from my knowledge of Prokofiev's own playing, I take an approach to the last movement of his Seventh Sonata which avoids a throwing motion, staying instead closer to the keys and using the wrist:



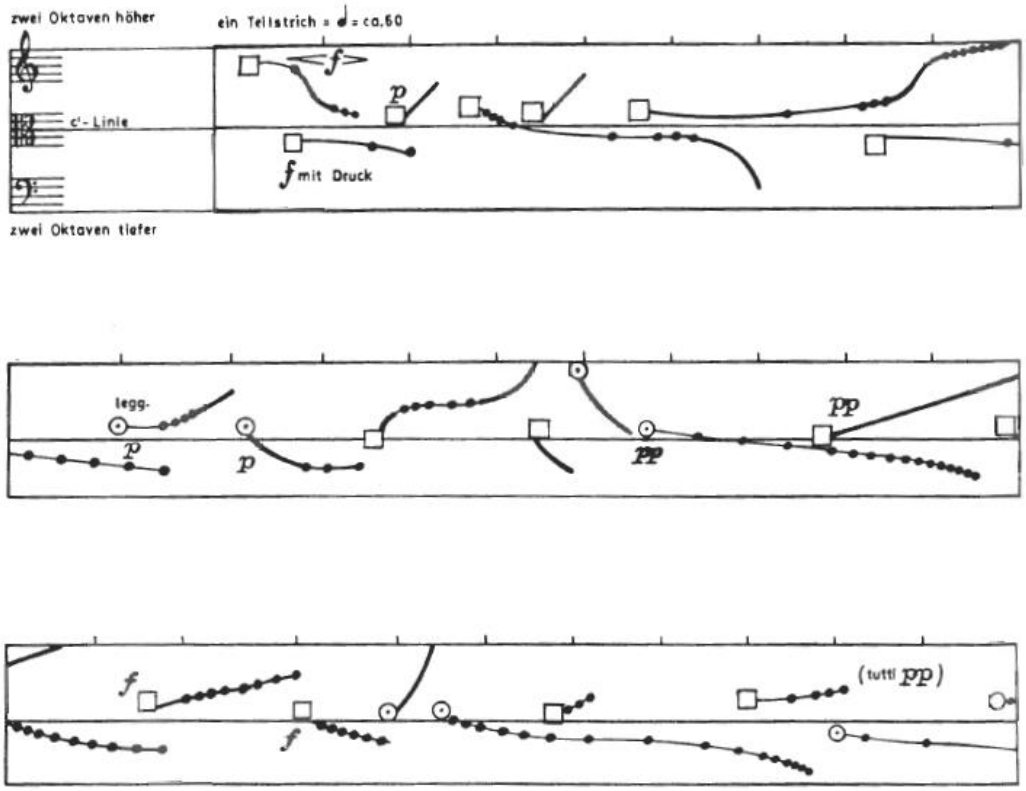
Mention Boulez 2.

Works Exploiting It

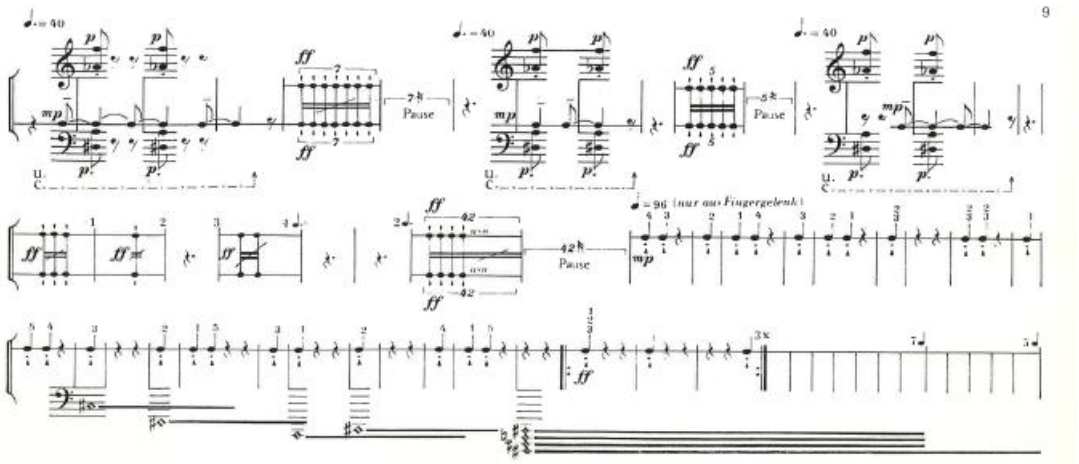
Sylvano Bussotti, *Pour Clavier* (1961)



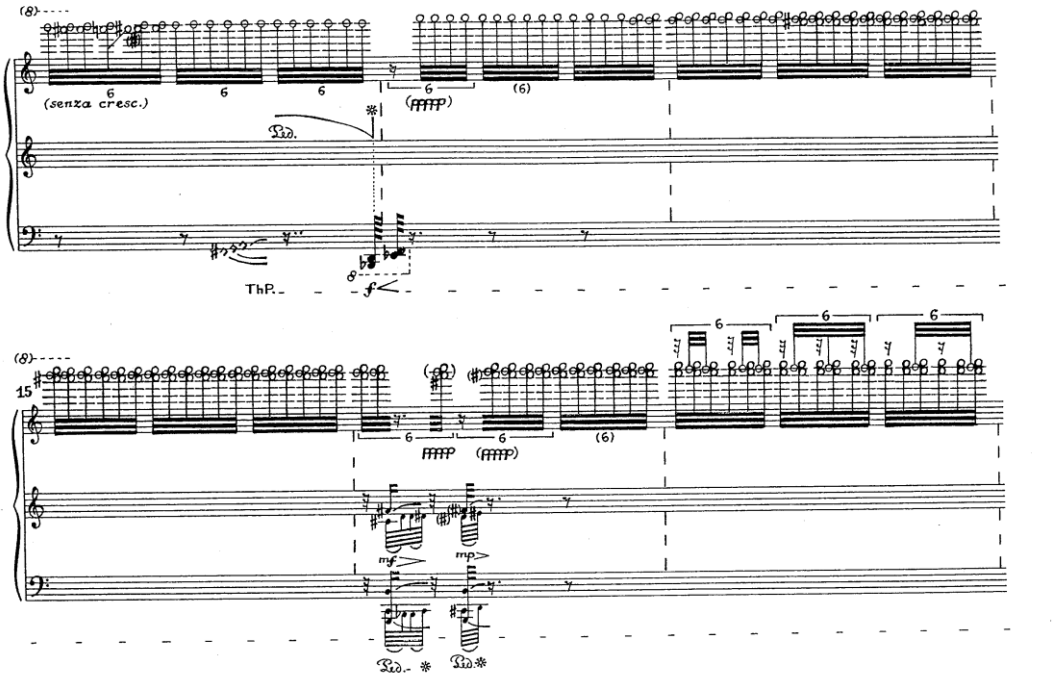
Helmut Lachenmann, *Guero* (1970)



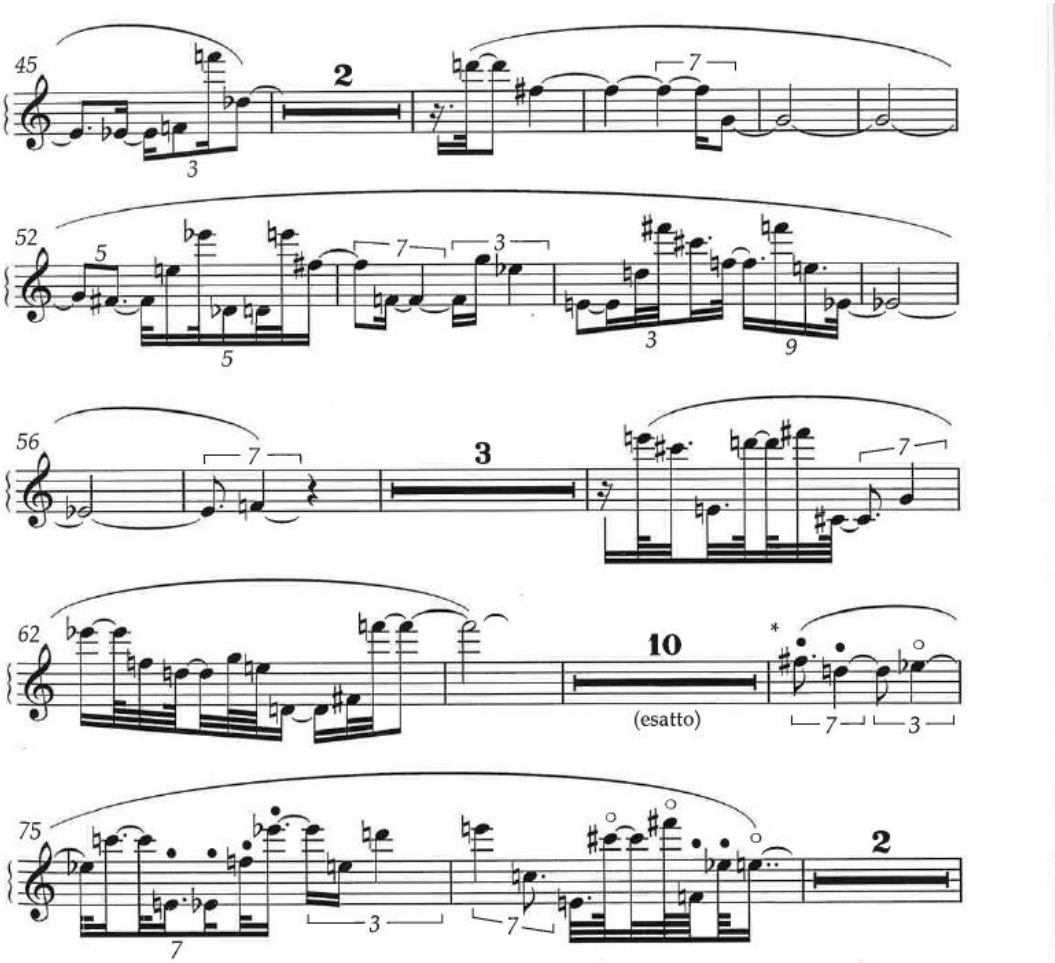
Nicolaus A. Huber, *Darabukka* (1976)



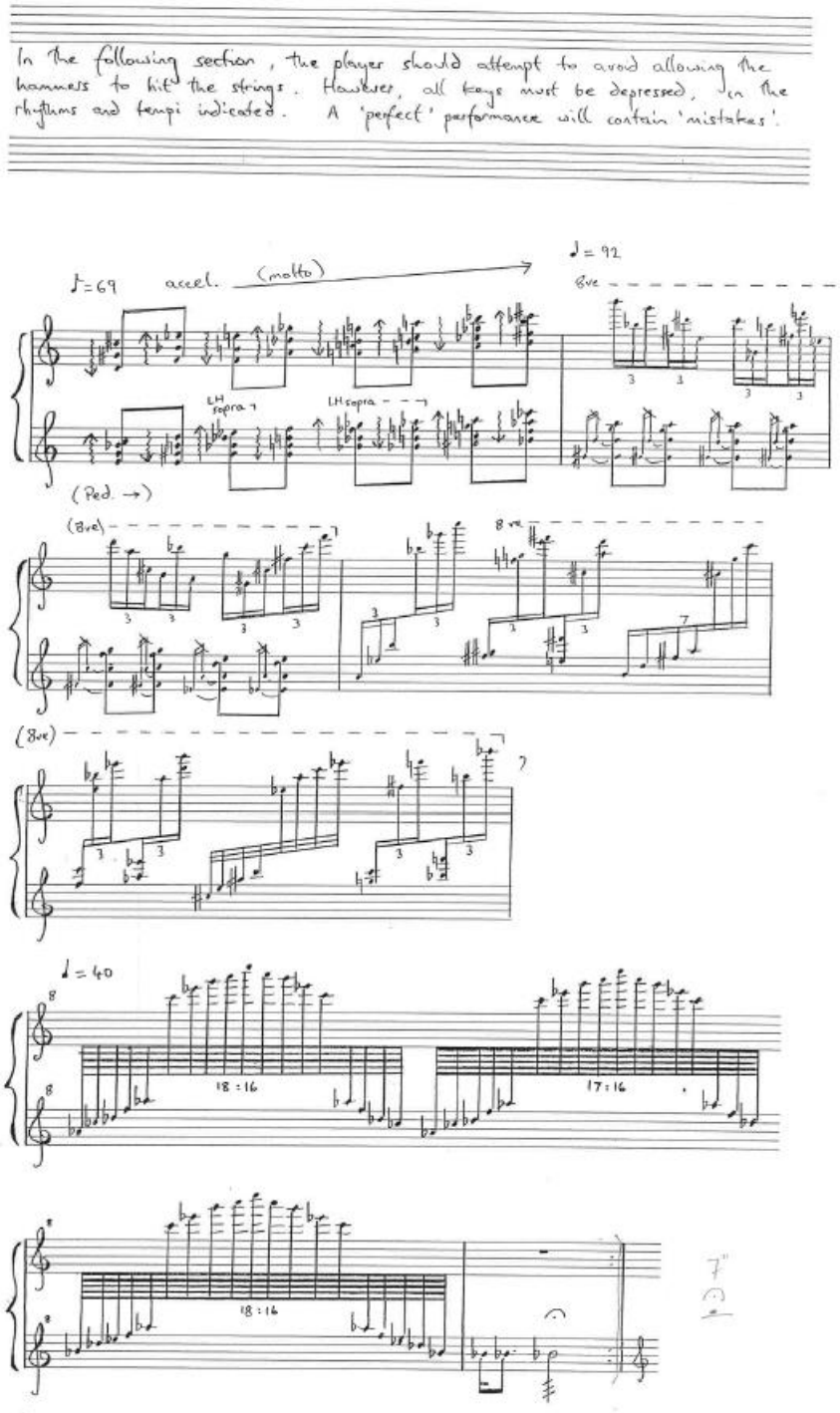
Salvatore Sciarrino, *Notturno 2* (1999) (have as PDF)



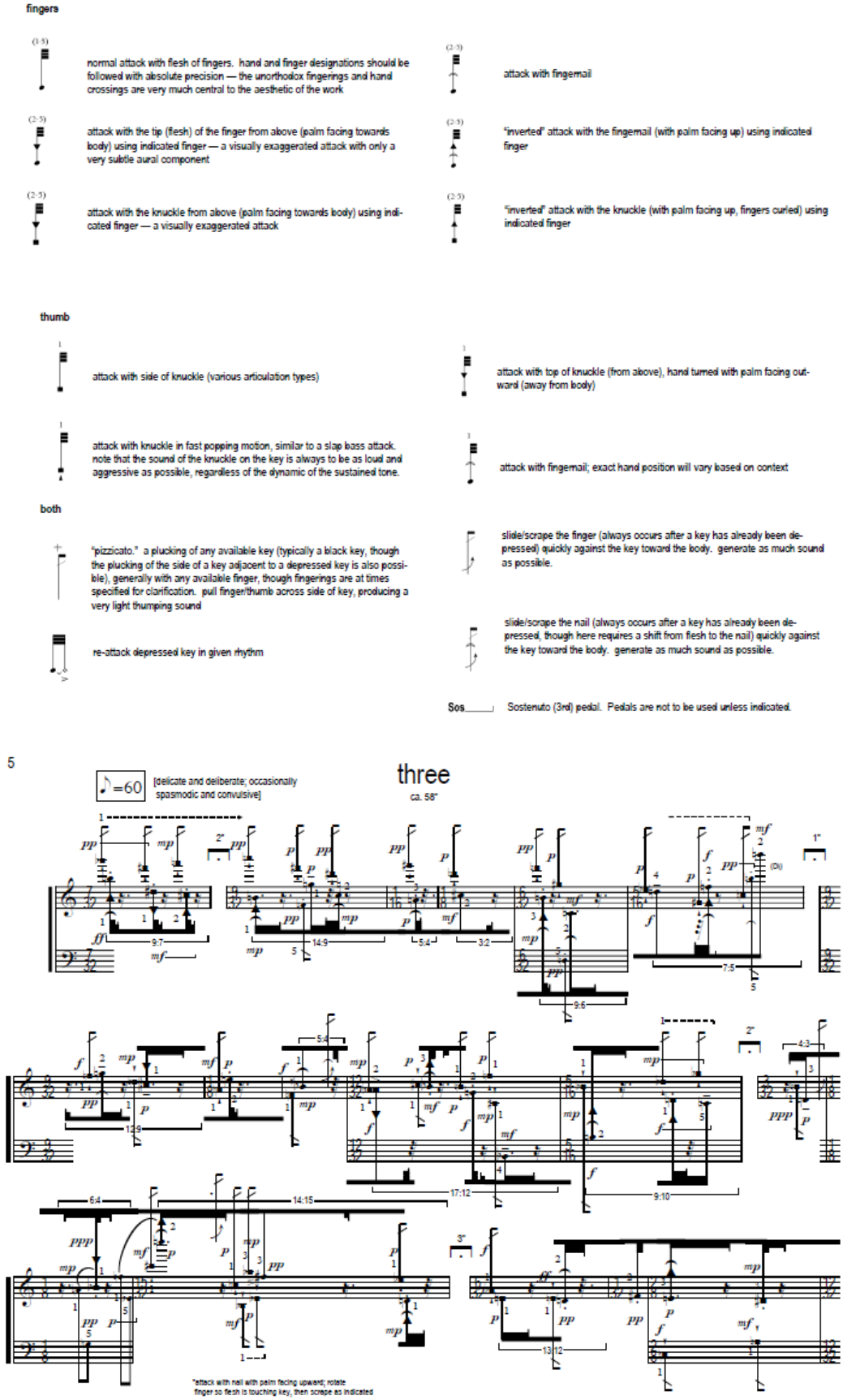
Richard Emsley, *for piano 10* (1999)



Ross Lorraine, *Tacet* (2000-2001?)

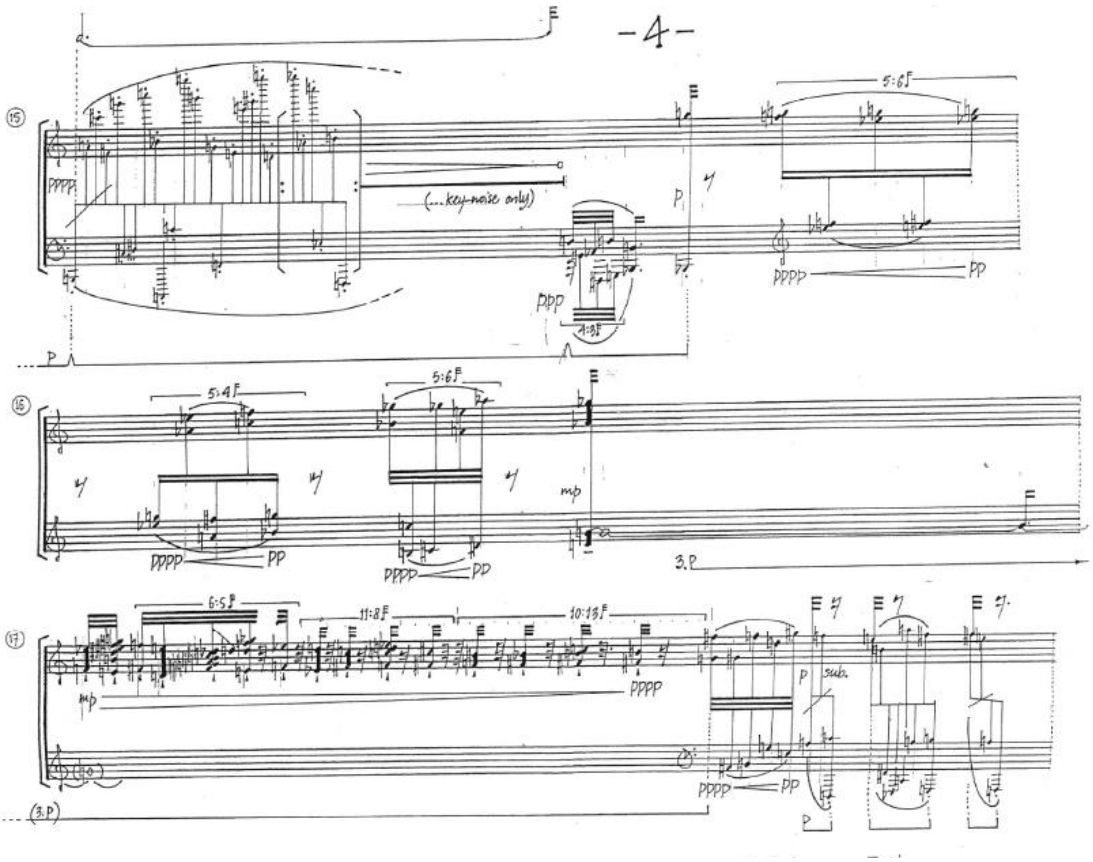


Aaron Cassidy, *ten monophonic miniatures for solo pianist* (2002-2003)



Other works employing this technique include Wieland Hoban's *when the panting STARTS* (2002-2004), an elaborately choreographed and immensely difficult work

with ten staves, one for each finger, and precise indications thus for fingering but also articulation and attack, and Richard Barrett's *lost* (2004) in which a passage 'dissolves' into pure key noise.



I firmly believe that key noise is an intrinsic aspect of pianistic sonority, and should be understood and employed meaningfully by pianists and teachers. This conception enables a clearer understanding of how pianists both past and present produced the sounds they did, and how one might seek to emulate these or create new ones.

Werner Goebi, Roberto Bresin and Ichiro Fujinaga published a new paper on this in late 2014 ('Perception of touch quality in piano tones', *Journal of the Acoustical Society of America*, Vol. 136, No. 5 (November 2014), pp. 2839-2850, downloadable at http://iwk.mdw.ac.at/goebl/papers/GoeblBresinFujinaga2014-JASA-PianoTouchQuality.pdf