

THE MIGHTY WRIST

MASTERING THE MOTIONS OF THE WRIST FOR OPTIMAL PIANO TECHNIQUE

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INTRODUCTION AND BACKGROUND

- Major teachers from multiple national piano schools
 - English/Matthay teacher in high school
 - French teacher at Oberlin for my undergrad
 - American/some Russian influence at UC San Diego for my DMA
- Reconciling disparate approaches
- Deep thinker about how and why technique works, history of piano technique and teaching, approaching piano playing with a composer's perspective
- Foundational philosophy: Every piano is essentially the same; every person is unique.

TRANSITION FROM HARPSICHORD TO PIANO TECHNIQUE

- Slow process
- The piano itself took nearly 200 years to reach its current modern form
- Many early piano pieces (C.P.E. Bach, Haydn) basically playable on either instrument
- The pedagogical tradition changed only after composers and performers began using the new piano in new ways
- Czerny: mostly based on old harpsichord technique
- Chopin: first composer/teacher to fully embrace the piano



PIANO TECHNIQUE ≠ HARPSICHORD TECHNIQUE

- Harpsichord:

- Strings plucked by plectrum activated by key
- No dynamic control
- Tone color extremely bright and charismatic
- Sustaining power relatively limited
- Musical role tended to be supportive and accompanying in most cases

- Piano

- Strings hit by hammers on a (complicated) lever
- Full dynamic control
- Tone color relatively neutral, cool, uninteresting
- Sustaining power much greater
- Musical role tended towards solo and concertante works
 - Soloistic even in chamber music

PIANO TECHNIQUE ≠ HARPSICHORD TECHNIQUE

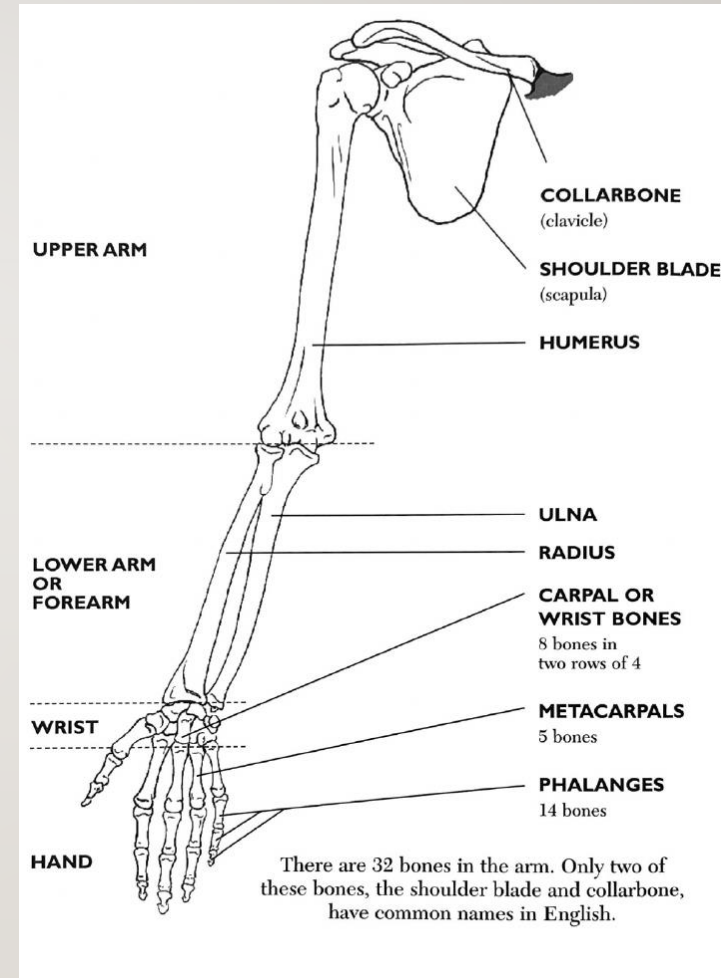
- Harpsichord technique:
 - Stable (not stiff) wrists
 - Emphasis on minimal finger attack necessary to push keys down
 - Arm weight unnecessary
 - Relatively few octaves/octave chords
 - Tendency to use minimal notes in a given chord
 - Accompaniment patterns contained within span of the left hand (no sustain pedal)
- Piano
 - Fully mobile wrists
 - Emphasis on variations in finger attack in order to maximize dynamic contrasts
 - Arm weight crucial for full dynamic range
 - Far more octaves/octave chords
 - Tendency to have more notes per chord to make piano sound richer
 - Accompaniment patterns extend over much greater range (sustain pedal)

CHOPIN'S ETUDES: TRUE TEACHING PIECES

- Chopin's innovations grew out of many composers' and pianists' contributions
- First set of pieces that require a pianist use the wrist in an optimal manner for the piano as an instrument
- Early reviews claimed these Études would “break your fingers”
 - Not just hyperbole: without proper wrist technique, they would!
- Beneficial for students even if they can only play at a moderate speed due to the technical skills they teach
 - Particularly helpful even at a slower speed:
 - Op. 10: no. 3, no. 4, no. 7, no. 8, no. 9
 - Op. 25: no. 1, no. 2, no. 5, no. 11

THE COMPLETE ARM

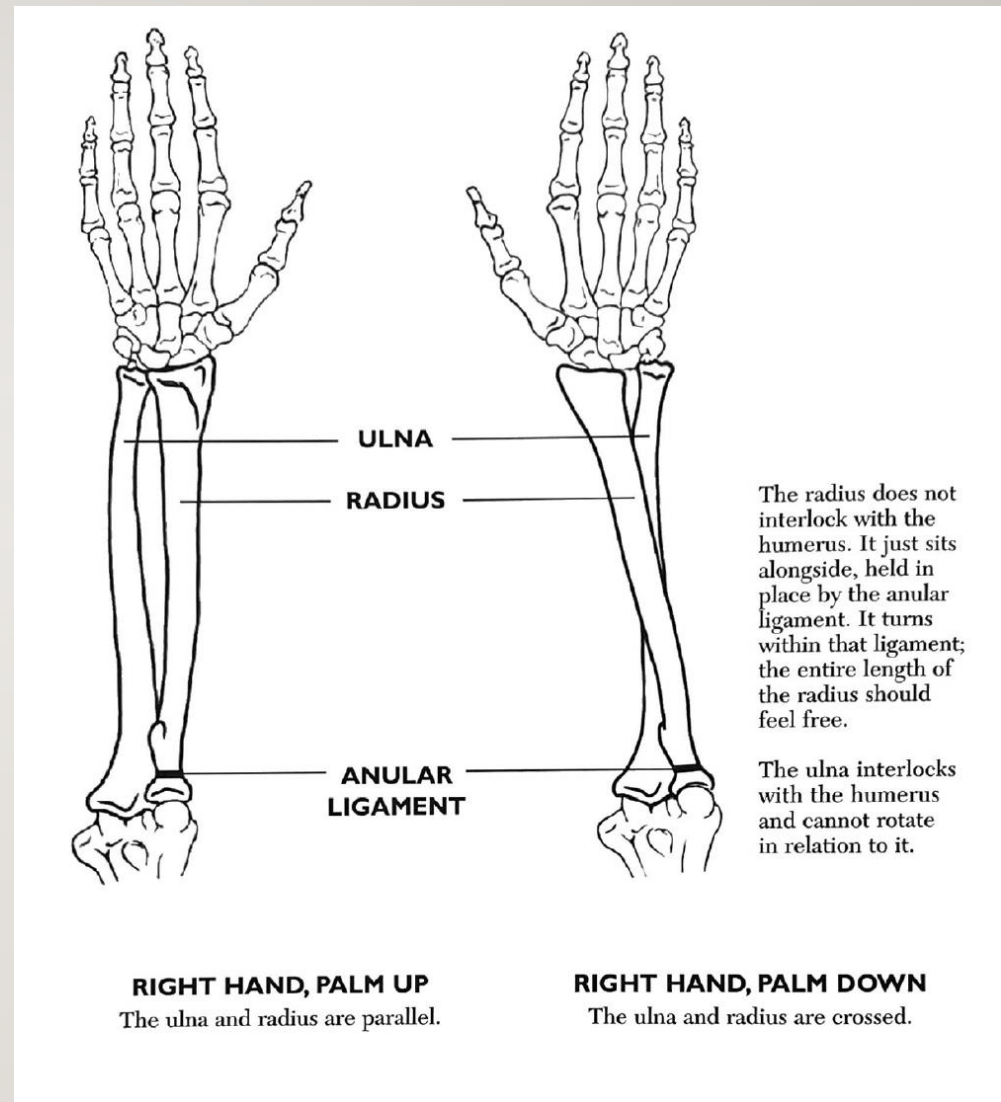
- The arm has four sections:
 - Hand/wrist
 - Lower arm
 - Upper arm
 - Shoulder girdle
- The arm only attaches to the torso at the collarbone
- The shoulder blade moves freely over the back



Images from *What Every Pianist Needs To Know About The Body*
by Thomas Mark

THE LOWER ARM

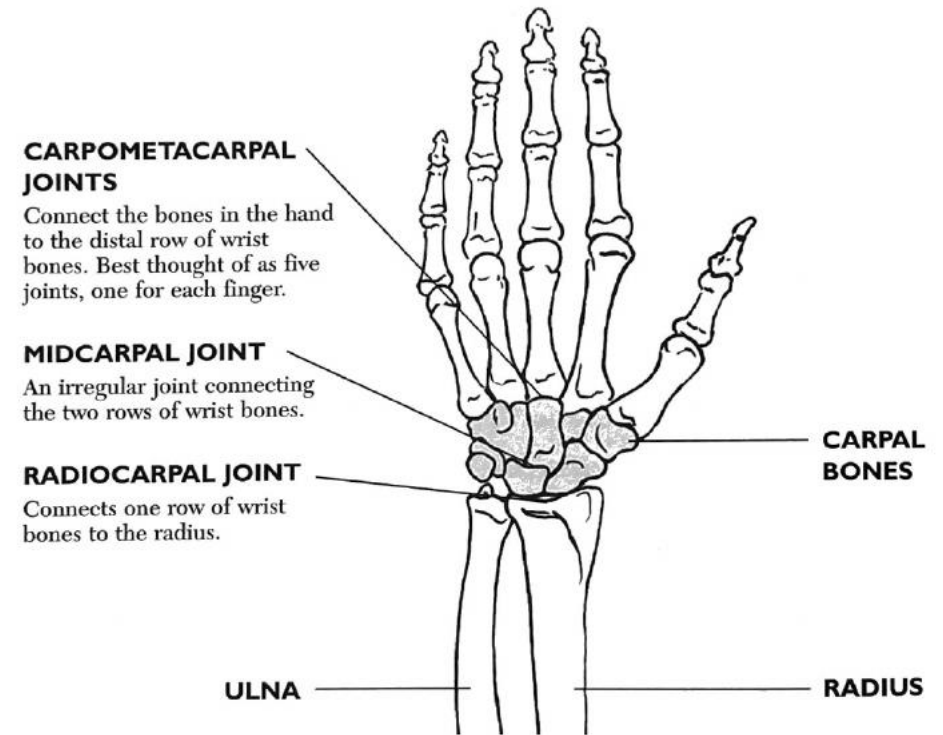
- Lower arm consists of two long bones, the radius and the ulna
- The ulna is the only bone that attaches to the upper arm (humerus)
- The radius moves freely in a rotational manner, hence the name “radius”
- Radius is crossed over the ulna when we have our palms down as in piano playing



Images from *What Every Pianist Needs To Know About The Body*
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WRIST AND FINGERS

- The wrist is both a joint and a structure
- Joint at the radius and ulna
- Structure is made up of pebble-like carpal bones
- Fingers (except thumb) have four bones, the bottom of which is hidden within the palm
- The thumb only has three bones and is opposable to the other fingers

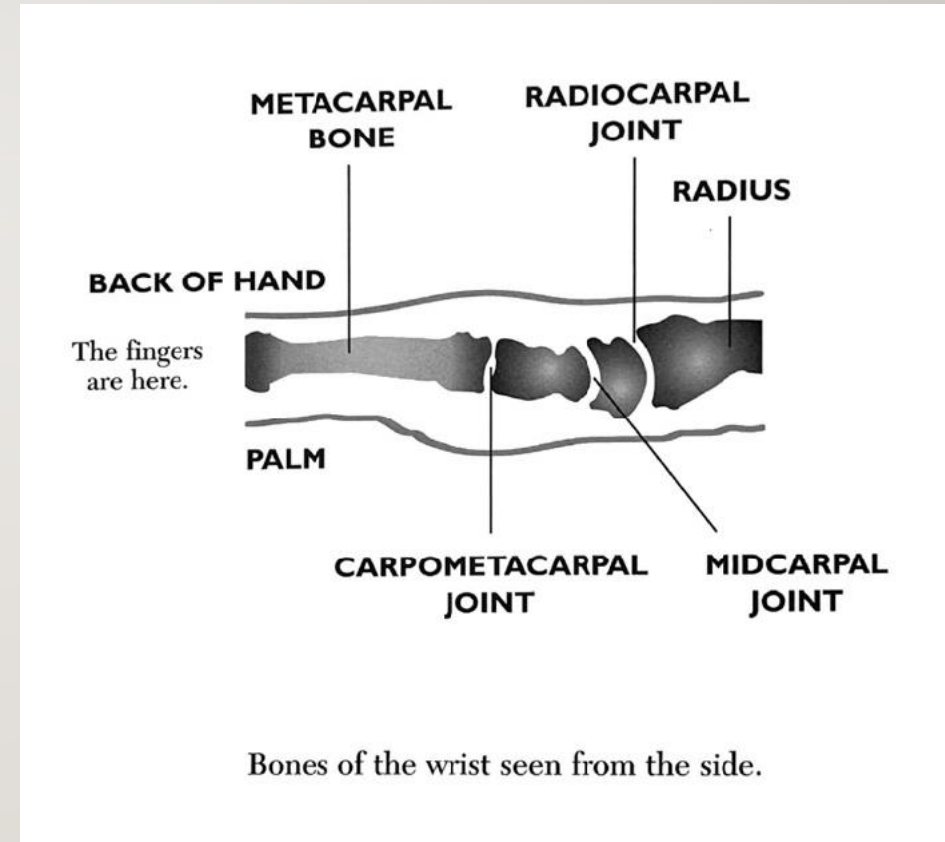


The wrist is a flexible structure, two rows of small bones connecting the arm and hand.
Right arm, palm up.

Images from *What Every Pianist Needs To Know About The Body*
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WRIST, SIDE VIEW

- Wrist joint (radiocarpal joint) is a rounded joint that allows smooth up and down motion
- Midcarpal joint also rounded, but has far less mobility than wrist joint
- Carpometacarpal joint is straight rather than rounded and has very little mobility

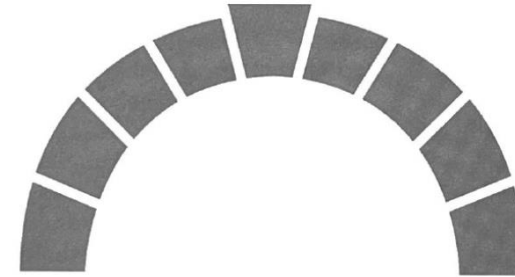


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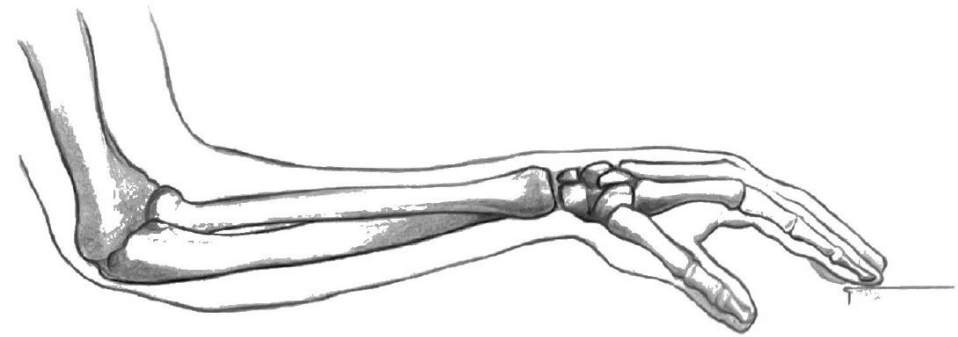
WRIST AS KEYSTONE

- Entire lower arm and hand is an arch that supports the weight of the arm
- Elbow on one end, fingertips on the other end
- The wrist serves as the keystone of this arch
- Better analogy: like a shock absorber in a car, as the wrist can move up and down and still support the weight of the arm

KEYSTONE



The geometry of the arch makes it an exceptionally efficient, strong, and stable structure.



The arch of the hand and forearm can be the basis of playing without tension, yet with ease, control, and power.

Images from *What Every Pianist Needs To Know About The Body*
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WRIST BIOMECHANICS

- Wrist serves as keystone or shock absorber of the lower arm-hand
- Leading from the wrist activates the entire arm through the clavicle and shoulder blade
- The wrist is crucial in releasing the muscles of the upper and lower forearm
- Wrist joint crucial in alignment of hand to lower arm (ulnar alignment, radial alignment)
- Most of the time, **ulnar (pinky) alignment is best**



TYPES OF MOTION

1. Wrist joint motions
 1. Up/Down (flexion/extension)
 2. Circular/Elliptical (up/down with lateral (adduction/abduction))
2. Forearm, led by the wrist
 1. Up/Down (stationary wrist)
 2. Lateral (left/right)
 3. Rotation (full and partial)
 4. Drawer (forward/back)

UP/DOWN MOTION (FLEXION/EXTENSION)

- Hinging at the radiocarpal and ulnocarpal joint regions
- “Up” in piano is wrist flexion, “down” is wrist extension
- Raising wrist in up motion quickly releases tension in the muscles of the forearm and within the hand itself
- Uses:
 - Two-note slur or “sigh” motive
 - Sharp up-wrist motion for marcato accents/sforzandos
 - Quick, loose hinging for fast repeated notes and chords
 - Release of hand extension in octaves, large chords, and other heavy passages



TWO-NOTE SLUR PASSAGES

Wolfgang Amadeus Mozart
Sonate Nummer 1 für Piano und Violine in C-Dur KV 6

Menuet 1.)



Allegro.

Adagio.



Vivace (♩ = 184) *leggiere* Op. 25-Nr 5

17 *scherzando*



Beethoven, Sonata #17
Op. 31, no. 2, mvt. I

Chopin, Etude, Op. 25, no. 5

SHARP UP-WRIST ACCENTS

Musical score for "The Merry Widow" (Act II). The score is written for a piano and voice. The piano part is in 2/4 time, with a key signature of one sharp (F#). The tempo is marked "Allegretto". The score is divided into three systems. The first system contains measures 1-4, the second system contains measures 5-8, and the third system contains measures 9-12. The piano part features a series of eighth-note chords in the right hand and a bass line in the left hand. The voice part is a single melodic line. The score includes dynamic markings such as *f* (forte) and *tr* (trill). A rehearsal mark "30" is present at the beginning of the third system.

Beethoven, Sonata #14, Op. 27, no. 2, mvt. 3

Sehr rasch (♩)

The musical score is written for piano. It begins with a tempo marking 'Sehr rasch' and a quarter note symbol. The first system is in 3/4 time, with a key signature of one flat. The right hand plays a rapid, ascending and then descending scale-like pattern, marked 'heftig' (forceful) and 'pp' (pianissimo). The left hand plays a simple bass line. The second system is in 4/4 time, continuing the right hand's pattern, marked 'pp' and 'sf' (sforzando). The piece concludes with a final chord in the right hand and a whole note in the left hand.

Schoenberg, Op. 23, no. 2

QUICK SIDE NOTE: FORCE VS. SPEED

- Lately there have been memes in piano land about how it is the *speed* of key action that changes the dynamic of a piano note, not the force or weight used
- Keep in mind Newton's Second Law of Motion:
 - $F=ma$, or Force is equal to Mass times Acceleration
- That is, in terms of physics, there is not a meaningful difference between a change of force and a change of speed, given that our arms do not change mass.
 - A change of force is caused by a change of speed; a change of speed directly affects the force involved.

QUICK HINGING FOR FAST REPEATED CHORDS

10

ETUDE VII.

Allegro molto. ♩ = 96.

ten. ten. ten. ten. segue

f sempre brillante p f

R. Schumann, Symphonic
Etudes, Op. 13, Etude VII

7

Vivace (♩ = 84)

Op. 10 - Nr 7

Chopin, Etude, Op. 10, no. 7

RELEASING HAND TENSION IN OCTAVES/CHORDS

R. Schumann, Symphonic Etudes,
Op. 13, Etude IX



A musical score for Liszt's Transcendental Etude #4, 'Mazeppa'. The score is written for piano and features a series of chords and octaves in the right hand, with a more active bass line. The key signature is one sharp (F#) and the time signature is 4/4. The piece is marked with a forte (ff) dynamic. The score includes the following text: "Фортениано в 7 октав. Piano à 7 octaves.", "il più forte possibile", and "poco rallent.". The score is written for piano and features a series of chords and octaves in the right hand, with a more active bass line.

Liszt, Transcendental Etude #4,
“Mazeppa”

Messiaen, Vingt regards sur l'Enfant-Jésus,
VI. Par Lui tout a été fait

A musical score for Messiaen's Vingt regards sur l'Enfant-Jésus, VI. Par Lui tout a été fait. The score is written for piano and features a series of chords and octaves in the right hand, with a more active bass line. The key signature is one sharp (F#) and the time signature is 4/4. The piece is marked with a forte (ff) dynamic. The score includes the following text: "(Contre-sujet changé de rythme et de registres)", "(Thème d'accords concentré)", "ff", "p", "sfz", "Red.", and "* trb~". The score is written for piano and features a series of chords and octaves in the right hand, with a more active bass line.

CIRCULAR/ELLIPTICAL MOTIONS

- Combination of the up/down motion with lateral motion of the forearm and adduction/abduction of the wrist joint
- Includes the benefits of muscle release of simple up/down motions
- Full circle or partial circle either direction
- Tendency of motion: RH goes counterclockwise, LH goes clockwise (this helps the thumb out!)
- Allows the fingers to maintain best possible alignment with the forearm in circular and/or widely spaced passages
- Uses:
 - Arpeggio accompaniment patterns
 - Widely spaced legato passages
 - Many types of “passagework” that wend and weave their way in swirling patterns

ARPEGGIOS (ACCOMPANIMENT PATTERNS)

Allegro sostenuto (♩ = 104) Op. 25-Nr 1

13 *p*

Ped. * *Ped.* *

Chopin, Etude in A-flat major,
Op. 25, no. 1

48 *fp*

Ped. * *Ped.* *

Beethoven, Sonata in B-flat major,
Op. 22, mvt. I

WIDELY SPACED LEGATO

(♩ = 144) Très doux

pp

2 *And.*

Ravel, Jeux d'eau

7. Beyond pitch-space

The musical score for 'Beyond pitch-space' is written in 3/4 time and consists of two staves. The key signature has one flat (B-flat). The score includes various musical notations such as eighth notes, quarter notes, and half notes, along with accidentals (sharps and flats). Interval ratios are indicated by brackets and text: 3:2, 5:4, and 8va. The notation is complex, with many notes and accidentals, suggesting a highly chromatic or atonal piece.

Stephen Lewis, Fantasy (2025)

PASSAGEWORK

2. Allemande



Bach, Partita in G major, II. Allemande

Beethoven, Sonata in C major,
Op. 53 "Waldstein" Mvt. I

Musical score for the first movement of Beethoven's Sonata in C major, Op. 53 "Waldstein". The score is written for piano in C major and 3/4 time. It features a complex and technically demanding passage. The first system includes a piano (p) dynamic marking and a forte (f) dynamic marking. The second system continues the intricate melodic and harmonic development. The score is marked with various fingering numbers (1-5) and includes a circled number 25 at the end of the second system, indicating a specific measure or section.

MORE PASSAGEWORK

Presto ($\text{♩} = 88$)

Op. 10 - Nr 4

4

f con fuoco *fp* *cresc.*

3

1 2 3 2 1 3 2 1 3 2 1 3 2

2 3 2 2

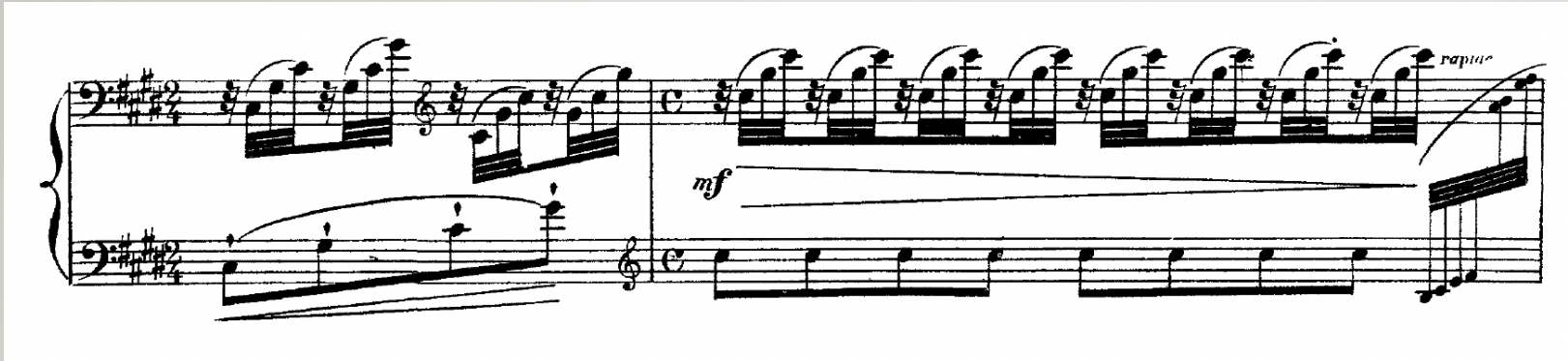
1 2

Chopin, Etude in C-sharp minor, Op. 10, no. 4

UP/DOWN MOTION (STATIONARY WRIST)

- Wrist remains still (ideally not stiff)
- Hinging motion occurs at the elbow
- Uses:
 - Alternating hand passages, especially those involving quickly repeated notes
 - Very “percussive” articulations, especially short and loud staccato notes
 - Clusters played with the palm or fist, and glissandi

ALTERNATING HAND PASSAGES



Ravel, Jeux d'eau

"Islamey: an Oriental Fantasy," by Mily Balakirev

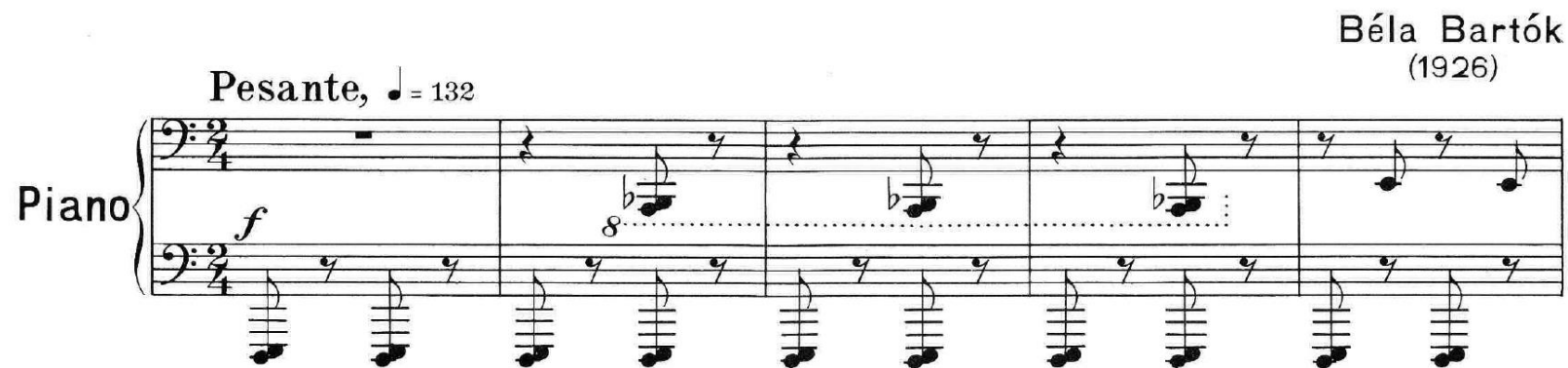


PERCUSSIVE PLAYING OR VERY SHORT STACCATI

Béla Bartók
(1926)

Pesante, ♩ = 132

Piano



Bartók, Out of Doors
I. With Drums and Pipes

Allegro.



Haydn, Sonata #50 in C major,
Mvt. I

CLUSTERS OR GLISSANDI

ff

mf

ff

ff

mf

fff

ff

Berio, Sequenza IV for piano

LATERAL MOTION

- Moving the hand and arm to the left or right over the keyboard
- Motion led by the wrist
- Uses:
 - Changes of position
 - Scales and arpeggios
 - Leaps

CHANGES OF POSITION

Allegro.

Measures 1-5 of the first movement of Haydn's Sonata #49 in E-flat major. The tempo is marked 'Allegro.' The key signature has two flats (B-flat and E-flat). The time signature is 3/4. The music is in G-flat major (three flats). The first measure starts with a treble clef and a bass clef, with a mezzo-forte (*mf*) dynamic. The second measure has a mezzo-forte (*mf*) dynamic. The third measure has a forte (*f*) dynamic. The fourth measure has a forte (*f*) dynamic. The fifth measure has a forte (*f*) dynamic. The piece ends with a double bar line.

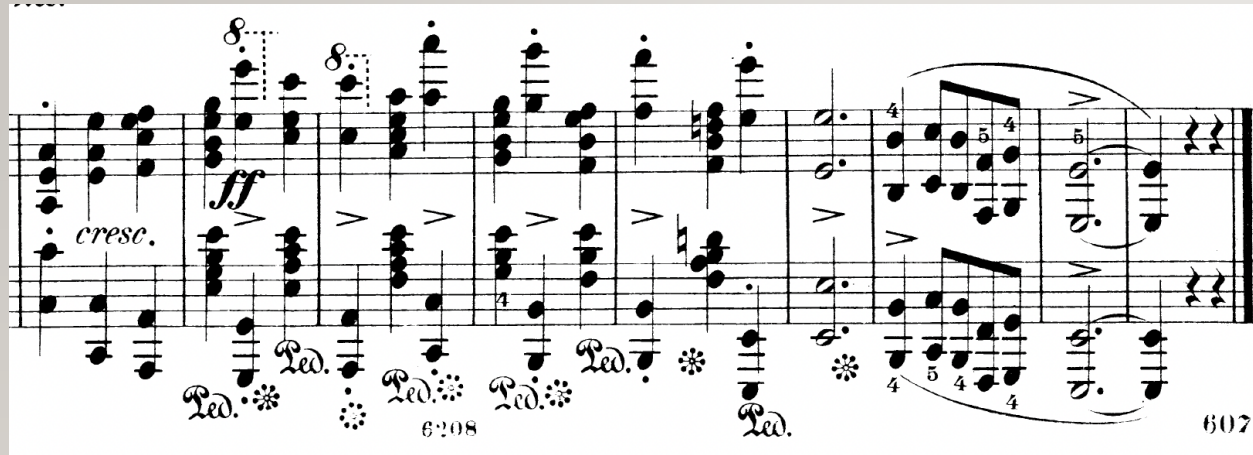
Haydn, Sonata #49
in E-flat major, Mvt. I

Non troppo lento, ♩ = 76

Measures 81-85 of the piece 'Wandering' from Bartók's Mikrokosmos, Vol. 3. The tempo is marked 'Non troppo lento, ♩ = 76'. The key signature has two sharps (F# and C#). The time signature is 2/4. The music is in D major. The first measure starts with a mezzo-piano (*mp*) dynamic. The second measure has a piano (*p*) dynamic. The third measure has a piano (*p*) dynamic. The fourth measure has a piano (*p*) dynamic. The fifth measure has a mezzo-piano (*mp*) dynamic. The piece ends with a double bar line.

Bartók, Mikrokosmos, Vol. 3
81 "Wandering"

LEAPS



Chopin, Sonata #2, Op. 35 Mvt. 2



Scriabin, Sonata #4, Op. 30, Mvt. 2



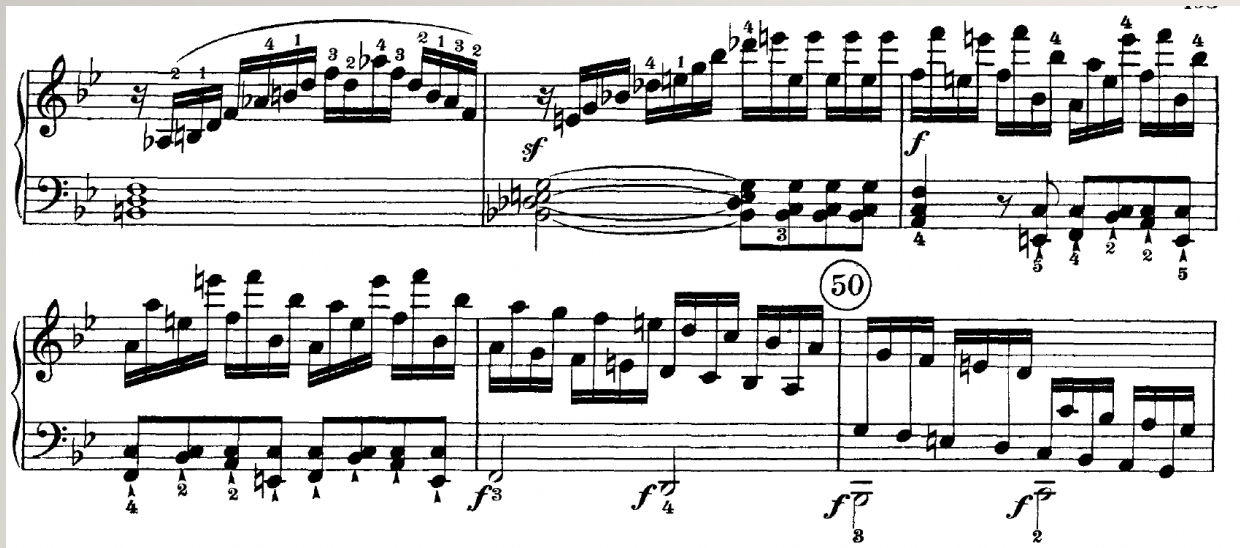
Brahms, Capriccio, Op. 76, no. 2

ROTATION (FULL AND PARTIAL)

- Turning the forearm radially from the elbow, like opening or closing a doorknob
- Important: with palm facing down, the forearm is already nearly completely rotated towards the thumb!
- Helps manage arm weight in back-and-forth patterns
- Uses:
 - Full rotation: broken octaves, distributed counterpoint, etc.
 - Partial rotation: melody line alternates with static interior pitch

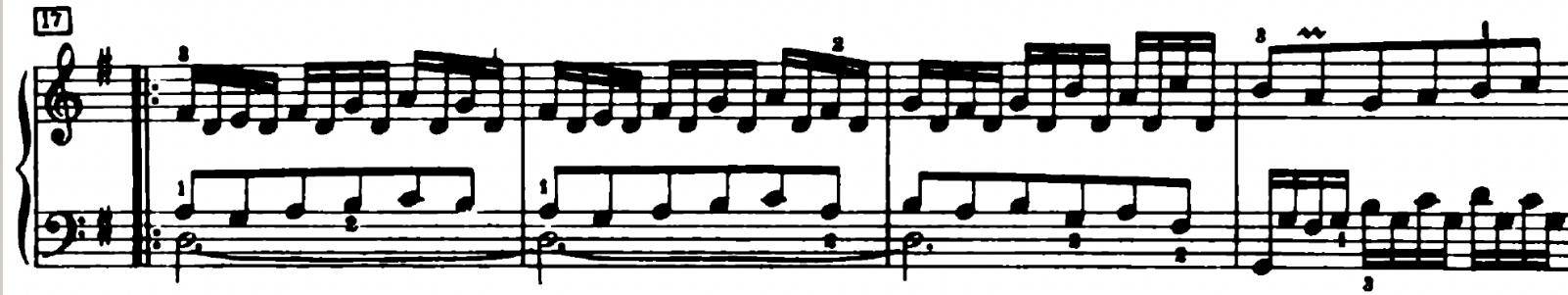
FULL ROTATION

Beethoven, Sonata in B-flat major, Op. 22, Mvt. I



Brahms, Piano Concerto #1 in D minor, Mvt. I

PARTIAL ROTATION



Bach, Prelude in G major,
WTC II

Excerpt from Frédéric Chopin's Etude in A minor, Op. 25, no. 11, measures 1-8. The tempo is marked "Allegro con brio" with a metronome marking of quarter note = 69. The key signature is A minor (no sharps or flats). The right hand plays a rapid eighth-note scale with complex fingerings (1-5). The left hand features a series of chords and triplets, marked with a forte (*sf*) dynamic. The piece is in 4/4 time. A double bar line with a repeat sign is at the end of measure 8.

Chopin, Etude in A minor, Op. 25, no. 11
"Winter Wind"

FULL AND PARTIAL ROTATION

Allegro.

p

5

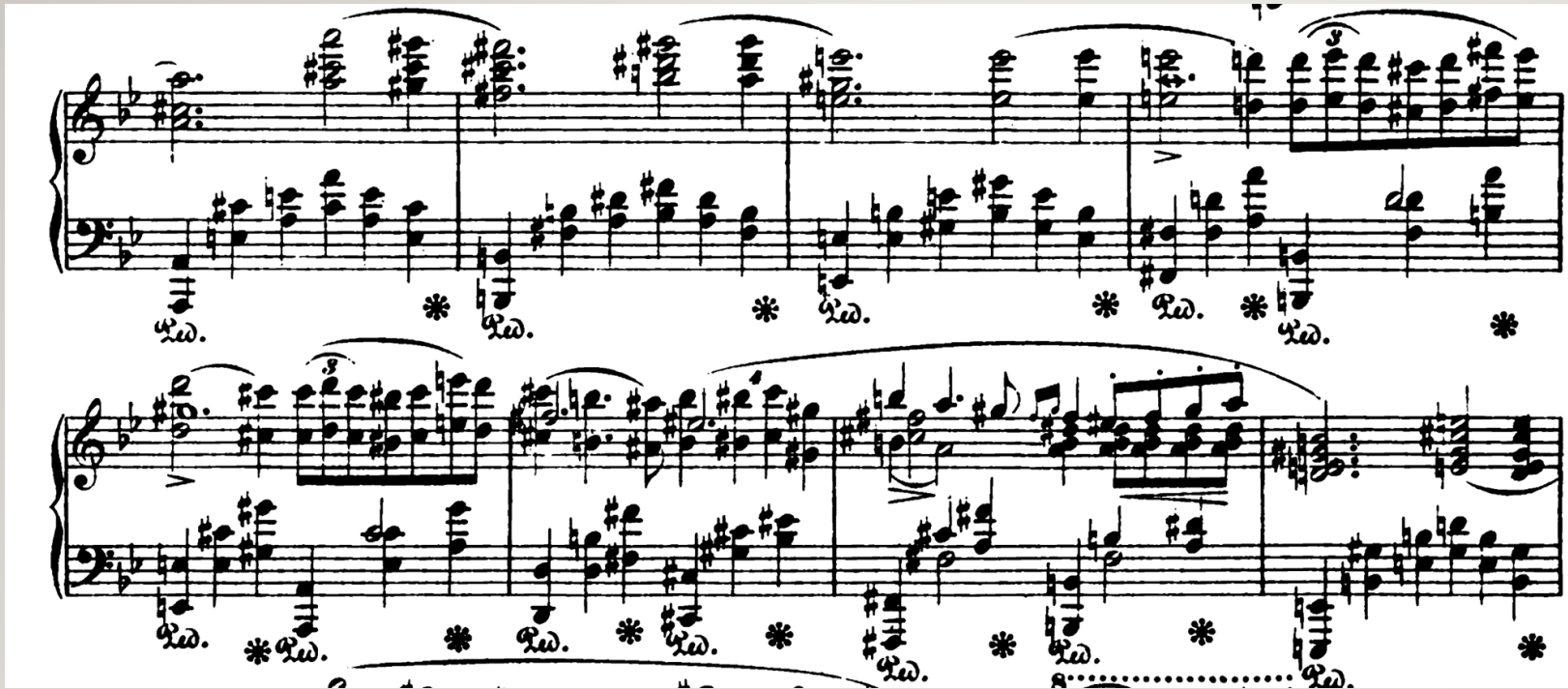
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Beethoven, Sonata in A-flat
major, Op 26, Mvt. 4

DRAWER MOTION (IN AND OUT)

- Moving the hand and arm further into or out of the keyboard
- Used to accommodate the hand position needed, especially concerning the thumb
- Should be minimized whenever possible as it is a large, slow motion
 - Especially in octave passages involving white and black keys
- When necessary, should be made as a clear, concise movement rather than a leisurely or circuitous movement
- Uses:
 - To move from positions with the thumb on white notes to positions with the thumb on black notes

BEST TO AVOID DRAWER MOTION IN THESE KINDS OF PASSAGES WHEN POSSIBLE:



Chopin, Ballade in G minor,
Op. 23

DRAWER MOTION IN PASSAGEWORK WHERE THE THUMB CROSSES UNDER TO BLACK NOTES

Handwritten musical score for Elliott Carter's Piano Sonata, Mvt. I, measures 157-159. The score is written for piano (mf) and includes the instruction *cantando espress.* The notation features complex, rapid passages in both the treble and bass staves, with a focus on the thumb crossing under to black notes. The key signature is three sharps (F#, C#, G#) and the time signature is 4/4. The score is presented in two systems, with measures 157-158 in the first system and measures 159-160 in the second system.

Elliott Carter, Piano Sonata,
Mvt. I

SYMBOLS FOR LEARNING AND TEACHING

Wrist Motion Symbols

up wrist ↑

down wrist ↓

full wrist circle

clockwise (CW) 

counter-clockwise (CCW) 

half circle

above CW 
CCW 

below CW 
CCW 

Lateral

right →

left ←

drawn in ↗

drawn out ↘

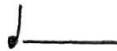
rotation, Full 

rotation,
asymmetrical 

Other Useful Symbols

do not connect V

connect 

hold 

hold until 

EXAMPLE: HAYDN'S SCHERZO IN F MAJOR

Scherzo in F Major
Hob. XVI:9

Franz Josef Haydn
(1732-1809)

Allegro

f-p

5

mf

10

cresc.

15

f *p*

20

The musical score is for a Scherzo in F Major, Hob. XVI:9 by Franz Josef Haydn. It is written for a single instrument, likely a horn, in 2/4 time. The tempo is marked 'Allegro'. The key signature has one flat (F major). The score is divided into systems, with measure numbers 5, 10, 15, and 20 indicated. The dynamics range from *f* (forte) to *p* (piano), with a crescendo marking. The score includes various musical notations such as slurs, ties, and fingerings.

CONCLUSION

- Every person's anatomy is unique; every pianist will ultimately have a unique technique
- Many principles remain the same, but different people will achieve these in their own ways
- The piano is not a perfectly ergonomic instrument
- Much piano music is written to the upper limits of physical possibility (on purpose)
- Highest goal should remain: making beautiful, expressive, creative music in a healthy and sustainable way

THANK YOU!

Thank you so much for attending my talk today. Please reach out to me if you have questions or comments about today's talk:

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website: www.chopinois.com

I offer coaching sessions in advanced topics (like today's talk) for music teachers, music professionals, and advanced students who are interested in continuing education or who are working on projects they want help with. I am also available for teaching one-off lessons, mock auditions, masterclasses, coaching sessions for chamber music, and can give talks on piano music, piano technique, musicianship, music history, theory, composition, improvisation, and other topics by request. Visit my website to learn more. I am based in Portland, Oregon, but can teach anywhere via Zoom.

