

FROM AND FOR A DOUBLE-JOINTED PIANIST'S PRACTICE ROOM:

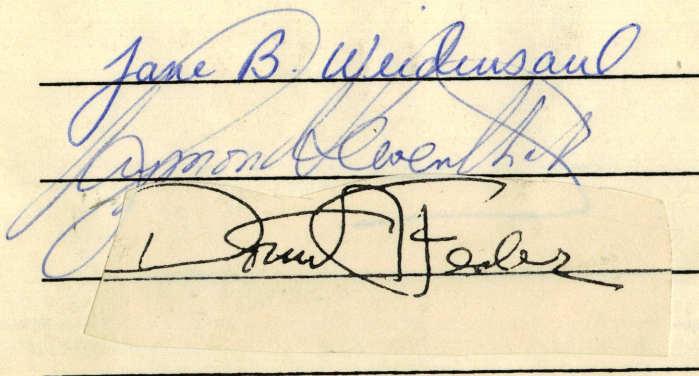
A PHYSIOLOGICAL AND PIANISTIC ANALYSIS OF THE
DOUBLE-JOINTED PIANIST'S PROBLEMS, WITH POSSIBLE
SOLUTIONS AND PRACTICAL APPLICATIONS FOR PIANO PLAYING

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ABSTRACT OF THE THESIS

From And For A Double-Jointed Pianist's Practice-Room

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The thesis examines various aspects of double-jointedness--a pianistic problem which unfortunately has been given hardly any attention in the overall output of pedagogical piano literature. The author provides a physiological and pianistic analysis of double-jointedness, followed by suggestions for possible solutions and practical applications to piano playing.

The thesis consists of two main parts: the first part is a physiological analysis of hyper-extension in the hands (double-jointedness); the second part is a technical inquiry into the subject, which includes description of symptoms of the double-jointed pianist's playing, suggestions for control of double-jointedness in piano playing, finger gymnastics, recommended pianistic exercises, and some additional suggestions for daily practice and choice of etudes.

Coping with double-jointedness in piano playing involves creation of a controlled tension in a hyper-relaxed hand. The pedagogical challenge is composed of strengthening the hyper-flexible fingers and making them function securely and firmly, without losing their natural suppleness.

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CHAPTER I

INTRODUCTION

Some Notes On Teaching "Technique"

Music is the listener's art.¹ It is our duty and mission as performers to broaden, to deepen, and to purify our listening and consequently give our audience a clue to a self-explanatory world of sounds.

Listening is both the source and goal of every musical activity. The essence of all learning procedures in performance therefore will be to focus the participating parts in music-making (memory, fingers, personality, intellectual and emotional understanding) on the player's inner hearing. A consistent concentration on one's own listening is as vital to the performer as is the visual sense to a driver. A driver would never imagine putting his car into gear with his eyes closed! So must a performer never start playing without hearing the music inside himself first.

The simplicity of complete devotion to one basic source is the most difficult thing to achieve and to follow

¹Leonard Ratner, Music--The Listener's Art (New York: McGraw-Hill Book Company Inc., 1977).

consistently in all arts. In our struggle to obey our inner hearing there occur many external disturbances which draw our attention away from our ears to our eyes, the body, or our own psychological difficulties.

Failing sometimes to grasp music merely by concentrated listening, we often choose (in both our playing and our teaching) to distinguish between various aspects of playing by putting artificial borderlines between them. Unfortunately the word "listening" is not very popular nowadays, but the distinction between "technique" and "musicality" is heard so often that one becomes convinced that those two are really different categories.

Where do all those distinctions come from? Is it not agreed that all music-making derives from listening? The reason for this controversy is the simple, prosaic fact that being a performer implies development of physical abilities which could be sometimes regarded as disconnected from one's inner ear. The problem of double-jointedness exists only in the pianist's practice room. It is not a musical problem. It is a physical disturbance which might stand in the way of one's own listening. The piano-teacher's role is to solve this problem in order to provide the double-jointed pianist with reliable tools which will help him to translate his listening into living sounds.

The paradox involved in any technical reform is obvious: for the sake of better functioning in the future, we temporarily cut the connecting line between the player's fingers and his inner hearing, and demand that separate work be done on the fingers alone. We draw the player's attention to muscular and physical sensations, thus preventing him from listening to himself and his old habits.

This separation between the physiological and auditive part of music-making is very dangerous. As necessary and constructive as it may sometimes be, the reforming procedure must be limited to a short period of time (preferably no longer than six months). It is disastrous for the player's future as a musician to be left with separated functioning areas. The teacher must consciously lead his student to a state of reunion of the improved technical equipment with the player's inner listening. Actually it is this reunion that we aim at when we say that a player has good coordination.

We must always remember that, as interesting and fascinating as it may be, "technique" for its own sake does not exist in music. It is a performer's tool and, therefore, a constant servant of the listener's art.

Statement of Purpose

Looking through the rich pedagogical piano literature, one finds that the special physiological-pianistic problem of double-jointedness has been given hardly any attention. Though most of today's piano teachers are quite aware of the psychological difficulty of performing, they have rarely tried to learn anything about the physiological facts concerning different types of hands and fingers. Consequently, the double-jointed piano student is treated like any other pianist, and is often told that if he would only "relax" and simply "listen to the music and play"--everything would be solved. "Relax" (though often thought of as a "magic word" which would free all of us from technical difficulties) would be the direct way to lose any sort of control if one happened to have a hyper-relaxed hand, which is the case in any double-jointedness.

It is a common truth that we are all different from each other. Yet many piano teachers tend to solve all their students' problems in one way, sometimes achieving good results, and sometimes absolutely disastrous results. In this era of information explosion we read dozens of articles every year about piano technique, yet they never specify how their methods would affect different

types of hands. Lately it has become more and more fashionable to talk about the body, the torso, the upper-arm, the wrist--yet the fingers, which do the job, after all, seem to be relatively neglected.

The need for a specific technical inquiry into the problems of double-jointedness is the raison d'être of this paper. The author hopes that the present investigation of the topic will achieve the goal of providing hope for double-jointed piano students.

CHAPTER II

PHYSIOLOGICAL BACKGROUND

The Arm

The human upper limb consists of the arm and the hand. The arm is the main part of the upper limb, from the shoulder to the wrist. It is composed of two parts: the upper arm and the forearm. The two parts meet in the elbow-joint.¹

Three bones enter into the elbow-joint formation: the humerus (the large bone of the upper arm) and the radius and ulna (two smaller bones of the forearm. (See Example 1.) Flexion and extension are the only possible movements at the elbow-joint. The pianistically important forearm rotation is not an elbow joint movement, but a shoulder-rotation which effects the rotation of the ulna in an opposite direction to that of the radius.²

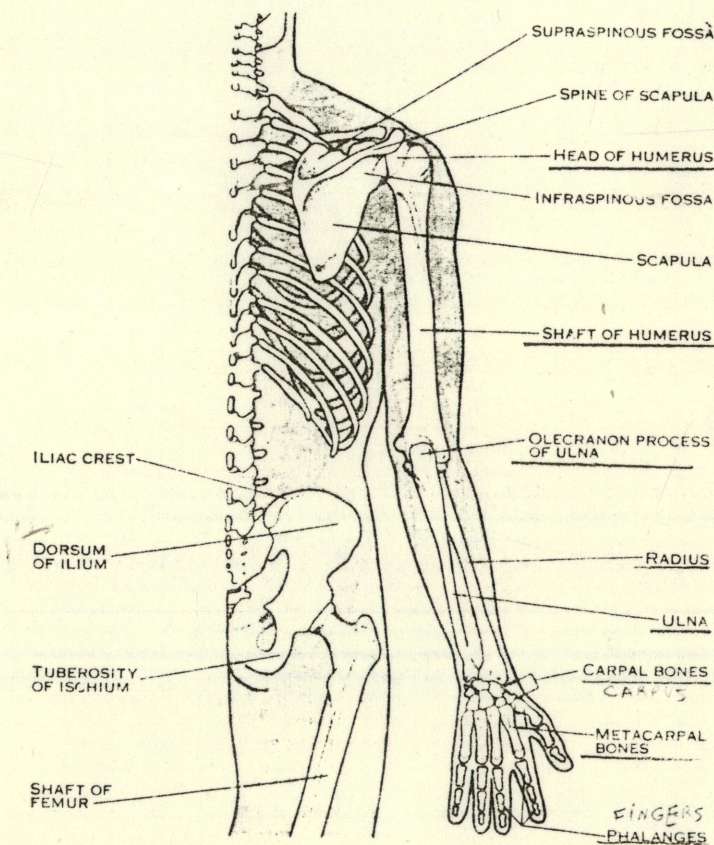
The radio-ulnar joint is situated in the region of the elbow, but is distinct from the elbow-joint. The

¹Encyclopaedia Britannica, 1974 ed., s.v. "Arm."

²Otto Ortmann, The Physiological Mechanics of Piano Technique (New York: E. P. Dutton, 1929), p. 14.

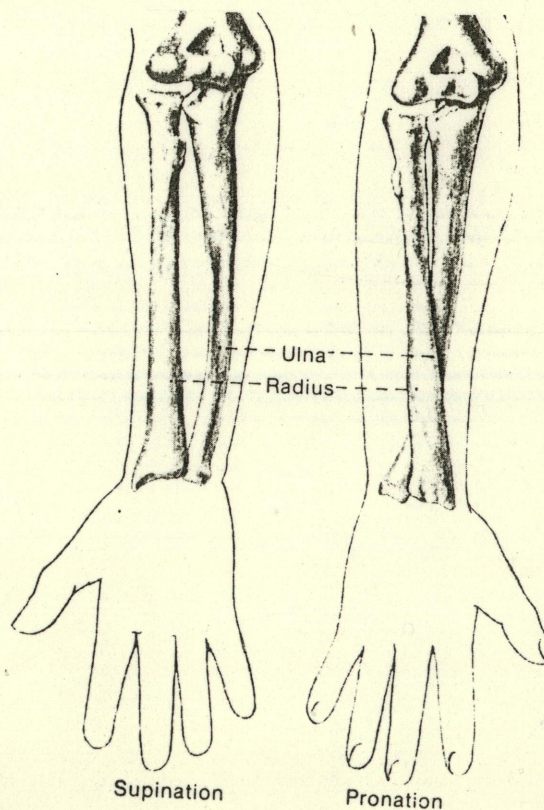
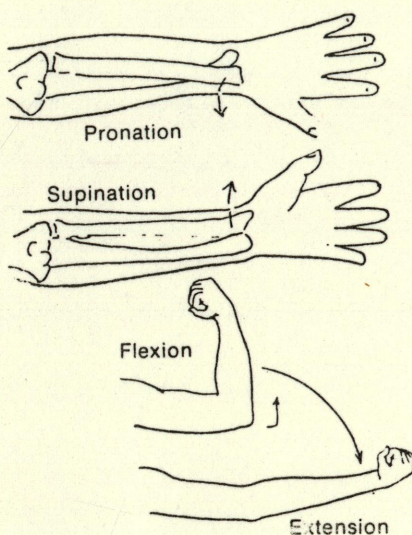
radio-ulnar joint is a modified ball-and-socket joint which permits supination (turning of the forearm and palm of the hand upward) and pronation (turning of the palm downward). This movement is produced by turning the radius over the ulna (pronation, the normal hand position in piano technique) or leaving the radius at the side of the ulna (supination). (See Example 2.)³

Ex. 1. The bones of the arm



³The data of the arm are only summarized here. The writer will provide more details about the hand and its joints in the following pages.

Ex. 2. Movements in the region of the elbow: flexion and extension of the elbow-joint; pronation and supination in the radio-ulnar joint.



The Structure of the Hand

The hand is a grasping organ at the terminal part of the human upper limb, consisting of the carpus (the wrist), the metacarpal bones (the palm), and the fingers.⁴ (See Example 1, p. 7.)

The carpal or wrist bones, eight in number, are arranged in two rows. Named in order from the radial to the ulnar side, the proximal row comprises the scaphoid, lunate, triquetral and pisiform bones and the distal row comprises the trapezium, trapezoid, capitate and hamate bones. (See Example 3, p. 12).

The metacarpal bones are five in number. They are miniature long bones. The metacarpal of the thumb is the shortest, and diverges outward from the rest. The bases of the other metacarpal bones articulate with the trapezoid, capitate and hamate bones; the metacarpal of the thumb articulates with the trapezium. (See Example 3, p. 12).

The fingers of the hand are distinguished by the names of pollex or thumb, index, medium, annularis and minimus.⁵ The thumb consists of two phalanges while each

⁴Encyclopaedia Britannica, 1974 ed., s.v. "Hand."

⁵For the reader's convenience, names of fingers other than the thumb will appear according to their numbers, as ordinarily marked in piano music.

finger has three. Each phalanx is a miniature long bone.

The carpal bones are firmly connected together, yet permit slight movements that are essential in the mechanism of the hand. The palmar contour of the wrist skeleton is like a gutter, bridged over by a dense ligament that makes it into a tunnel through which pass blood vessels, nerves and tendons for the fingers.

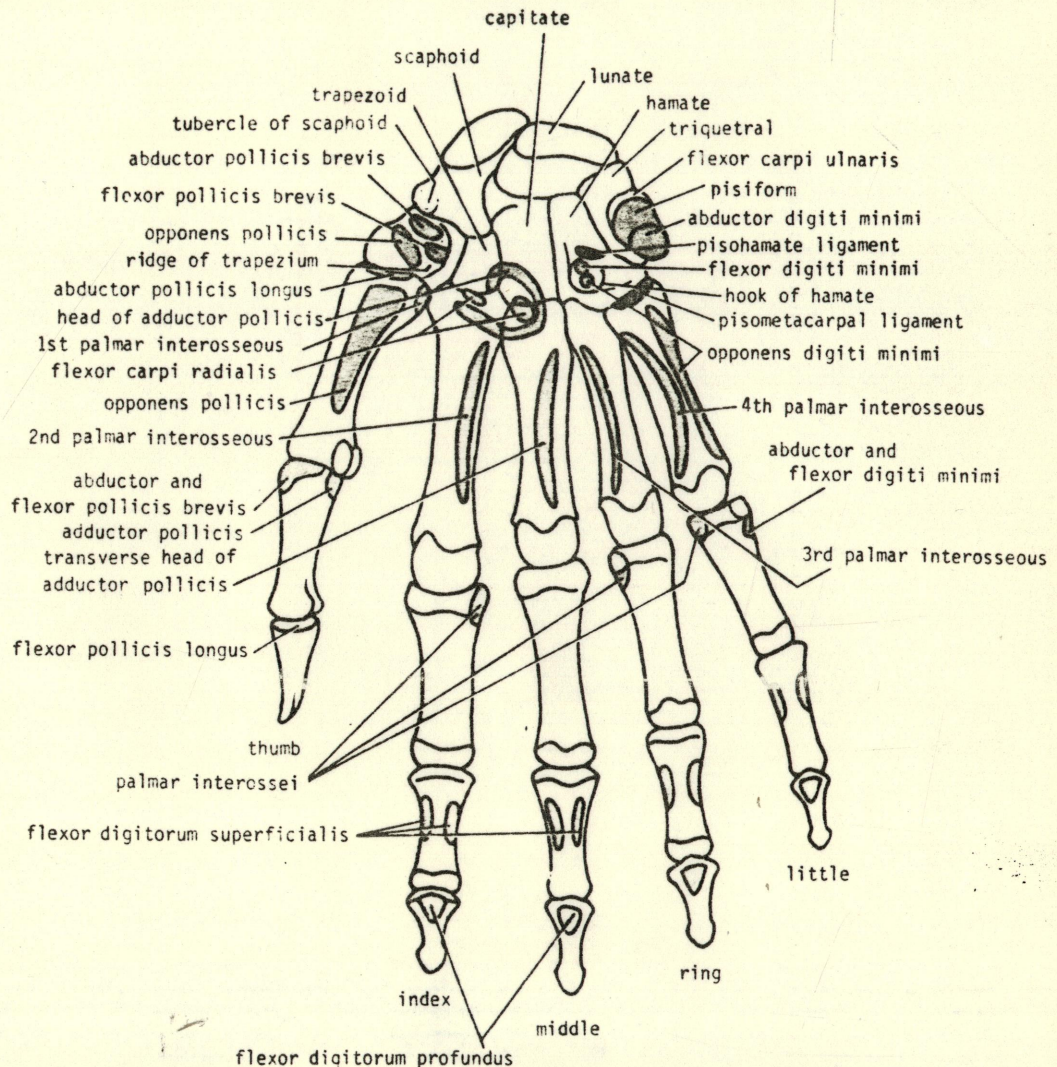
The joints are the points at which two bones connect. Since the human hand consists of many small bones, the functioning in the connecting areas, namely the hand joints, is extremely important.

In any joint the essential feature is a sliding of one surface over another. In order to reduce friction caused by such form, two synovial membranes (one for each articulating surface) are placed between the bony surfaces, and are constantly moistened by the synovial fluid. Joined to the sides of the two bones, near their ends, and extending from one bone-head to the other, are ligaments, consisting of connective tissue. Their physiological function is to hold the ends of the bones within the articulating cavity. Thus, the ligaments surround the joint loosely during the range of a natural movement, but become restraining and inelastic when the movement reaches its physiological limit. (See Example 4 for placement of joints and ligaments in the hand.)

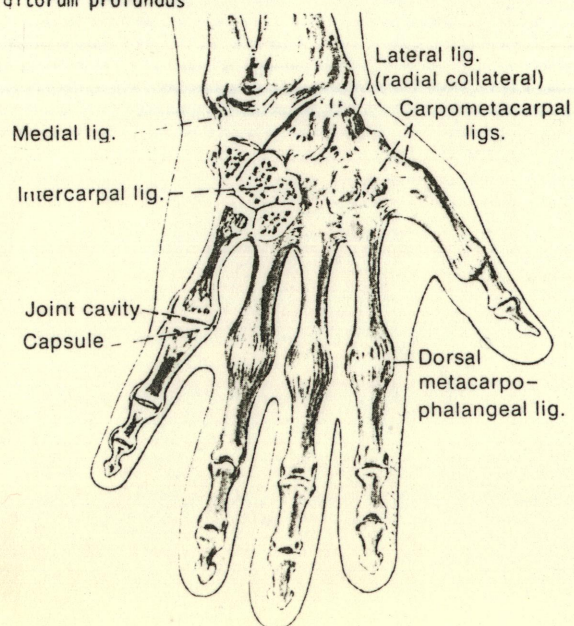
The joint is always surrounded by at least two sets of muscles which act as its "stabilizers." Every muscle exerts a certain constant degree of pull, performed in direct opposition to that of the other. This simultaneous pull on both sides makes possible an immediate response to a nerve stimulus.

The thumb has three joints, of which the first articulates with the trapezium of the carpus. This joint, located close to the wrist, differs radically from the equivalent joints of the other fingers, and is chiefly involved in the thumb movements of piano technique. The first joint of the thumb is technically called the metacarpal joint and performs as the axis of most of the thumb movements: flexion and extension (bending and straightening out); abduction and adduction (moving the finger away from the midline and toward the midline--those movements are used in the passing under of the thumb in scales and arpeggios); and a slight rotation (moving the finger around its axis). The second thumb-joint (metacarpo-phalangeal) and the third thumb-joint (interphalangeal or nail-joint) both assist the first in flexion and extension. Other movements at the two joints of the thumb (namely, abduction, adduction, and rotation) are impossible in the normal hand but are frequently seen in double-jointedness.

Ex. 3. Skeletal and muscular structure of the hand



Ex. 4. Ligaments
of the hand



The other fingers have three joints: hand-knuckle (metacarpo-phalangeal), mid-joint, and nail-joint (both inter-phalangeal). The hand-knuckles are modified ball-and-socket joints with the lower spherical articular surface wider than the upper articular surface. Accordingly, movement is essentially directed downward and inward, toward the palm and normally not beyond a straight angle in the opposite direction. The finger-joints are capable of flexion and extension. Limited circumduction (moving the bone so that the end of it describes a circle and the sides describe a cone) is possible at the hand-knuckles.

The Muscles

A muscle is a complex organ consisting of striped muscular tissue, many blood vessels, and nerve fibers, the function of which is to shorten or to exert tension along some linear axis. The muscle is enclosed in a connective tissue, which besides holding its substance in place, transmits the pull of the fibres to the tendon and through this to the point of attachment, thus producing a movement. Muscular tissues on the human arm include shoulder muscles, muscles of the upper arm, muscles of the forearm, and muscles of the hand. The size and strength of a muscle depend upon the size, weight, and position of the parts it moves. Thus, the most powerful muscles of the upper limb are found in the back and in the chest.

The muscles are that part of the anatomical structure which make the various movements without outside force. The possible movements in the human arm are flexion-extension, abduction-adduction, lateral and medial rotation, circumdation, pronation, and supination.

The simplest muscular movement involves a coordination of muscles. In a certain position, a simple straight line movement of the hand necessitates movement of the entire muscular system of the arm.

The action of the muscles is controlled by impulses sent down from the brain and spinal cord through the nerves to the muscles. Stimulated by the nerve fibres, the muscle becomes hard, develops tension, resists stretching and can perform active mechanical work. A short time after the stimulus, the muscle returns to its original soft and elastic condition. This sequence of contraction and relaxation is called a twitch. If the stimulus is repeated at a high enough frequency there is not enough time for the contracted state to decline between one shock and the other. The muscle therefore remains in a state of maintained contraction called a tetanus. All voluntary or habitual movement is tetanic in character. The shortest voluntary contraction (including the pianistic staccatissimo) is induced not by a single neural impulse, but by a rapid

series of such impulses. Exercises and muscular development do not increase the number of muscle fibres. They affect the size and growth of the existing fibres.

Usually the muscles responsible for movements in a certain part are not situated in the part itself, but in one of the previous joints. Accordingly, the muscles moving the shoulder-girdle are situated in the trunk (in the neck, chest, and back) and not in the shoulder itself. The muscles in the shoulder move the upper arm; the muscles of the upper arm govern the movements of the forearm and those of the forearm regulate the movements of the hand and some of those of the fingers. The special problem discussed in this document requires that attention be given to the muscles in the forearm and in the hand.

Muscles in the forearm fall into four general classes: flexors and extensors of the wrist, flexors and extensors of the fingers, pronators and supinators of the forearm, and abductors and adductors of the wrist.

Muscles of the hand contain three sets of muscles: a middle set (interossei and lumbricales), an external set (thumb muscles) forming the fleshy part of the base of the thumb (the thenar eminence), and an internal set (fifth finger muscles forming the hypothenar eminence). The combination of the action of opponent muscles in both eminences--the opponens pollicis muscle of the thumb,

in the thenar eminence, which pulls it towards the fifth finger, in the hypothenar eminence, which pulls it toward the thumb--plays an important role in giving stability to the hand. (See Example 3, p. 12.)

The basic movement of the parts of the hand is that of opposing the thumb to the fingers. This division of the hand is clearly illustrated in the "grasping" reflex of the infant. The next finer division separates the four fingers into two groups: the second finger as one, and the third, fourth and fifth fingers as the second group. This division is illustrated in the extension of the second finger while the others are flexed, hence the name "index" finger.⁶ The anatomical basis for this separation is found in the accessory tendons (vinculae) which connect the third, fourth, and fifth fingers, but leave the second finger free. The unequal freedom of the third, fourth, and fifth fingers results largely from the fact that the fifth finger action is helped by the muscles of the hypothenar eminence, which re-enforce the finger flexion muscles, whereas the greater freedom of the third finger over the fourth results in part from its freedom on the second finger side. The

⁶Webster's Dictionary defines "index" as "that which points out," q.v. Webster's New Universal Unabridged Dictionary, rev. ed. (1970), s.v. "Index."

characteristic "weakness of the fourth finger," the bane of most piano students, is caused by the tendinous interconnections between the third and fourth, and between the fourth and fifth fingers.⁷

The normal finger position, with regard to the lateral motion (abduction and adduction), is parallel to the mid-line of the hand. Abduction, a drawing apart or spreading of the fingers, requires more muscular effort than adduction--the bringing together of the fingers. A transition, therefore, from close to open position is accompanied by an increase of effort.

Definition of Double-Jointedness

The term double-jointedness is formed from the non-medical adjective "double-jointed." Webster's Dictionary defines "double-jointed" as "having joints that permit limbs, fingers, etc. to bend at other than the usual angles."⁸

Both the adjective (double-jointed) and the noun (double-jointedness) are occasionally mentioned in some

⁷Ortmann, p. 44.

⁸Webster's New Universal Unabridged Dictionary, 2nd rev. ed. (1970), s.v. "double-jointed."

physiological pianistic sources. The problematic aspects of the term, which makes it inadequate for medical and physiological use, are strongly emphasized in Otto Ortmann's study:

The use of the word double-jointedness is unfortunate. The articulation is not double; that is to say that there are not two joints present for the normal one. The difference is merely one of degree; the formation of the bones at the joint in addition to the stretch of capsular ligaments and tendons permitting the bones to move further over the articulation surfaces than normally.⁹

Unfortunate as the word may be, it is still the only one in frequent use among piano teachers which defines the condition mentioned above. However, there is no mention of it in medical sources. The terminology found there is hyper-extension which is defined as an "extreme or excessive extension of a limb or part."¹⁰ The origin of the word is the Latin verb extendere which means "to stretch out."¹¹ Special attention to this particular condition is given by medical sources on joint diseases and connective tissues diseases. Hyper-extension could be symptomatic of diseases such as rheumatic fever, Marfan syndrome, Marfan types, and

⁹Ortmann, p. 234.

¹⁰Dorland's Illustrated Medical Dictionary, 26th ed. (1981), s.v. "hyper-extension."

¹¹Taber's Cyclopedic Medical Dictionary (1981), s.v. "hyper-extension."

Ehrls Danlos syndrome.¹² The most famous patients having trouble with hyper-extended joints (including hand-joints) were Abraham Lincoln (1809-1865) and Napoleon Bonaparte (1769-1821).

The hyper-extended ("double-jointed") hand is usually long, thin, and extremely flexible. The fingers' phalangeal bones are usually long in proportion to a short back of the hand (the metacarpal bones). "In order to strike a key nearer to the point where the thumb strikes, the long fingers have to take up a strongly flexed controlled position which will be detrimental to the facility and ease of playing."¹³ Weak and strongly backward-bent phalanges hinder the working of the fingers as units and thus reduce the reliability of their movements.

The grasping ability of the hyper-extended hand is slightly weaker since its flexors are less dominant than its extensors. The balance of muscular pull is turned toward the back of the hand instead of toward the palmar side of the hand, where it is most frequently needed.

¹²Sergio Magalini and Euclide Scrascia, Dictionary of Medical Syndromes, 2nd ed. (Philadelphia: J. B. Lippincott Company, 1981), p. 87.

¹³József Gát, The Technique of Piano Playing (London: Collets Publishers Ltd., 1980), p. 131.

The excessive range of motion possible as a result of the "looseness" in the joints is caused by one of the following possible factors.

1. Well-rounded form of bone-ends and a noticeable gap between the base of one bone and the head of the other.
2. Relative looseness of the capsular ligament which permits greater motion than that normally found.¹⁴
3. Sometimes it is the double effect of bone-formation and hyperlaxity of the ligaments which causes double-jointedness. The skeletal cause can be revealed by an X-ray test, whereas the absence of bone cause makes the ligamentous inference safe.

¹⁴As stated already in Chapter II, p. 10, the function of the ligaments is to act as restraining, inelastic factors which determine the limit of the motion.

CHAPTER III

DOUBLE-JOINTED FINGERS IN PIANO-PLAYING

The condition of double-jointedness may occur in any joint, series of joints, or in all joints of the hands. This chapter will describe in detail types of hyper-extension in the finger joints.

The Thumb

The "breaking-in" of the middle thumb-joint (thumb knuckle) occurs most frequently. The pianistic damage caused is quite serious since the "breaking-in" of the thumb-knuckle interferes with the stretch between the thumb-tip and the little finger, reducing it often to a point at which octave-playing becomes impossible. (See Example 5.) The physiological cause is found in the extensor-pollicis which extends the nail-joint of the thumb, and then by passing over the middle-joint tends to extend that also when unopposed by the flexor. (See Example 15, p. 30.)

Ex. 5. "Breaking-in" of the thumb's knuckle



The hyper-extended nail-joint of the thumb seriously interferes with the independent movement of that finger and deprives the finger of the ability to play lightly and evenly, since there is no controlled focus of action on the finger-nail. (See Example 6.)

Ex. 6. Hyper-extended thumb's nail joint



In the case of the thumb, getting used to flexing the nail-joint will automatically flex the knuckle too, and thus control the hyper-extension. This "remedy" cannot be used in case of a definite inherited fault of skeletal formation. In this case there are not many chances for any cure, since bone-formation cannot be changed. However, that condition, if caused by ligaments, could be controlled by creating an awareness of the fingers' joints. (See Chapter V, p. 42.)

The Second Finger

The normal second finger is more flexible than the others (for reasons stated already in Chapter II, p. 16). In the case of double-jointedness this finger could be so hyper-relaxed that it actually stops functioning as one unit and is continuously "jerking" around.

"Breaking" of joints is possible in all the three finger-joints and sometimes at any combination of two joints in the finger. (See Example 7.)

Ex. 7. "Breaking-in" of the second finger's knuckle's joint and nail's joint simultaneously



The pianistic translation of this deficiency is an incapability to trill evenly in any of the common combinations: 1-2, 2-3 (see example 8), 2-4, and 2-5 (used mostly in tremolos).

Ex. 8. "Breaking-in" of second finger's nail joint in trill



The arpeggios and broken chords requiring even alternation of the thumb and second finger and vice-versa would always sound heavy and uneven in the above condition. A typical example of an "impossible passage for the double-jointed second finger is the following non-legato accompaniment figure in the first movement of Beethoven's "Waldstein" Sonata. (See Example 9.)

Ex. 9. Ludwig van Beethoven, Piano Sonata in
C Major op. 53 "Waldstein," mm. 23-24



Development of the flexors of the second finger and careful, constant observation of its functioning as a unit, would be the only remedy in this case. (See Chapter V, p. 50.)

The Third Finger

The flexibility of the third finger is centered in the hand (see Chapter II, p. 16). Tendencies of the nail joint to "break-in" (Example 10, p. 27) and of the finger's knuckle to "cave-in," could damage the finger's independent functioning and its ability to trill and arpeggiate.

Ex. 10. "Breaking-in" of third finger's nail-joint



Flexion exercises for the knuckles and pressure exercises for the nail-joint can cure those tendencies. (See Chapter V, p. 59.)

The Fourth Finger

The characteristic weakness of the fourth finger is quite obvious in the hyper-relaxed hand. "Joint-breaking" frequently occurs here not only in single joints but also in combinations of two joints broken simultaneously (in the manner of the hyper-flexible second finger; see p. 24, and also Example 11, p. 28).

Ex. 11. Simultaneous "breaking-in" of the fourth finger's knuckle and nail joints



The middle joint, which is also capable of "caving-in" in other fingers, might reveal weaker tendencies in the fourth finger. This inclination becomes quite obvious in some extended five-finger positions and arpeggios. (See Example 12.)

Ex. 12. "Breaking-in" of fourth finger's middle joint



The remedy for all those tendencies is the creation of a controlled tension in the hyper-relaxed finger, further development of the flexors and constant strengthening of the finger-tip (for further details, see Chapter V, p. 51).

The Fifth Finger

Hyper-extension in the knuckle of the fifth finger is seen as frequently as the "breaking-in" of the thumb's middle joint. The weakness of the fifth finger in the hand of a double-jointed pianist becomes even more obvious on black keys, where lack of control of the nail-joint (Example 13) or weakness in the middle joint (Example 14) could cause slipping from the black key to the neighboring white key.

Ex. 13. Nail joint's "breaking-in" (fifth finger)



Ex. 14. Middle joint's "breaking-in" (fifth finger)



Hyper-extension of the fifth finger's knuckle is often activated by the passing under of the thumb. As mentioned already in Chapter II, the stability of the hand is gained by the contraction of two muscles: the opponens pollicis muscle of the thumb which pulls toward the fifth finger and the opponens digiti minimi of the fifth finger which pulls it in return toward the thumb. When the little finger is hyperextended, the equilibrium gained by the muscular contraction is disturbed, and consequently the hand loses its stability (as seen in Example 15).

Ex. 15. Hyper-extension in the fifth finger's knuckle activated by the passing under of the thumb



The fifth finger is often a trouble-maker for many pianists. Therefore one should always work on strengthening it. (See Chapter V, p. 50.) The important role played by

the two fifth fingers was well-defined by renowned Russian pianist Anton Rubinstein (1829-1894), who called them the two "conductors" of music, owing to their role in playing bass and melody lines. So much responsibility for such small, weak fingers! One can easily agree with Heinrich Neuhaus's opinion:

Poor fifth fingers! So much is demanded of them! Hence the conclusion: Develop the little finger in every way. Make it into the strongest pillar and the dome of the hand.¹

A Weak Arch

A "weak-arch" position of the hand is the condition which implies "caving-in" of the knuckles' joints. Another term for this condition is "depressed knuckles." (See Example 16.)

Ex. 16. A "weak arch"



¹Heinrich Neuhaus, The Art of Piano Playing (London: Barrie & Jenkins, Ltd., 1973), p. 75.

This position was extremely common among harpsichord-players in the eighteenth century, who believed that the finger-stroke should start from the second finger's joint. With the increasing demands for strength in chords and busy orchestral textures in the Romantic piano literature, the "arched" position--which introduces the finger as a unit from the knuckle to the finger-tip--gradually replaced the "weak arch" position. The "arched" hand provides the pianist with a stronger, longer, and more flexible tools for satisfactory execution of various technical demands on the heavy action of the modern piano.

A tendency to "weak-arch" hand-position is quite symptomatic of weak fingers. Constant work in strengthening the fingers and "building-up" the arch would be of great help to the student. (See Chapter V for recommended exercises.)

Inherited Double-Jointedness versus Uncorrected Finger-Breaking

Careful examination of the definition of double-jointedness (see Chapter II, p. 18) reveals the fact that it is not an abnormal "crippling" but merely a question of degree of flexibility. We were all born with a certain degree of flexibility, and double-jointedness is just an extreme demonstration of it.

Loose ligaments and certain skeletal formation (see Chapter II, p. 20) are the physiological reasons for double-jointedness. Yet, these components may be found in every young beginner at the piano (ages three to twelve), since the process of ossification in the hand is not completed till the age of twelve. A serious consideration of this fact makes the responsibility of the beginner's piano-teacher a very heavy and crucial one. Uncorrected "breaking-in" (so typical of young players who find difficulty in control of the nail-joint when the middle joint is flexed) and "caving-in" of the knuckles in this early stage create wrong habits, which eventually become second nature to the player. Thus, it is possible that any beginner, taught badly, will develop into a sort of double-jointed pianist, and correction of those wrong habits becomes extremely difficult in later stages.

In these days of liberal education, the discipline of detailed, controlled work on one's fingers is quite rare. On behalf of "quick advancement" of the student's technique, many important details are swept under the rug. Most students who start professional music degrees in institutions of higher learning cannot perform a scale properly. This inadequacy of performance at the undergraduate level in academic music departments was one of

the reasons which caused Manfred Bukofzer (1910-1955) to call them, and rightly so, "an organized mediocrity."²

An example of how an incorrect indication given by a teacher can ruin a student's technique is given in the following anecdote, told by renowned Dutch pianist Egon Petri:

Words are responsible for most misunderstandings between human beings and, when they are divested of the gestures, inflections of voice, and facial expression of the living personality who pronounced them, they are apt to become dead and poisonous.

Take for instance the old rule--"lift your fingers." That was and is an excellent recommendation, because in spite of what the relaxationists and weight-adherents say, a finger does not come back of its own accord after having been lowered, but has to be "lifted" by a muscular effort, however slight. But if you mean by lifting "lifting as high as possible" you are in for trouble. You may strain your tendons, you may get the idea that your fourth finger will never be as strong as the others because you cannot lift it so high (this erroneous idea cost Schumann his pianistic career), your tone will very likely become dry and brittle and you will certainly lose much valuable time.

To show you to what ridiculous excesses this precept can lead, let me tell you of a little experience I had in this country some years ago. An elderly lady came to me and played the Nocturne in E-Flat by Chopin with very highly raised fingers, but so feebly that there was hardly any tone--in fact some of the keys did not produce any sound at all. I asked her how she had been taught and found to my amazement that her teacher had instructed her to practice very slowly, with fingers raised as high as possible--on the piano, you think?--oh no, away

²Manfred Bukofzer, The Place of Musicology in American Institutions of Higher Learning (New York: Liberal Arts Press, 1957), p. 18.

from the piano just in midair. When she showed me how she did it, slowly and stiffly describing angular lines in empty space I did not know whether to laugh or to cry. . . .³

We do not know whether the lady mentioned above was double-jointed or not, yet the symptoms of double-jointedness are there: hyper-extension, lack of control in the finger-tip, feeble sound. If her teacher were to teach a young, obedient beginner in the same manner, that student would develop soft knuckles--a weak arch.

Obviously, a person with a naturally strong and solid hand would not develop symptoms of double-jointedness. But the young, flexible beginner could easily be trained to hyper-extend or hyper-relax his fingers, thus gradually developing the symptoms of a double-jointed pianist.

³Egon Petri, "Problems of Piano Playing and Teaching," Be Your Own Music Critic (Garden City: Doubleday, Doran & Company, Inc., 1941), p. 140.

CHAPTER IV

SYMPTOMS OF DOUBLE-JOINTEDNESS

In the Beginner

It is hard to determine double-jointedness in a young beginner (ages three to twelve), since the carpus is cartilaginous at birth, and the process of the ossification of the bones is not completed till the age of twelve.¹ More than that, the "breaking-in" of the nail-joints in the second, third, fourth, and fifth fingers is so very common that there is hardly anyone who does not experience it in the first stages of piano playing. (See Chapter III, p. 33.) Yet, an experienced teacher may observe an increased tendency to "joint-breaking" in some students, and may face special difficulties in trying to make these students abandon their wrong habits.

Given the heavy responsibility of instructing the beginner, the teacher should pay close attention to the

¹X-ray records of ossification patterns in the hands are today used to chart growth rate and growth normality in children. See Richard Snell, Clinical Anatomy For Medical Students (Boston: Brown & Company, 1979), p. 412.

differences of structure of his students' hands and try to adjust his methods to the special demands of each case. Careful consideration should be given to the following data: the proportion of the length of the fingers to each other, the proportion of the thickness of the fingers to their length, the form of the finger joints and the proportion of the length of the individual phalangeal bones in each finger.² A careful evaluation of those areas identified (considering the fact that they might change as the child grows) will enable the teacher to predict possible technical disturbances in the future.

In order to avoid later trouble this writer would advise the teacher not to assign scales to the student too soon. The scale is not the smallest element in piano technique. In fact, it is an elaborate accumulation of various basic elements, which should be mastered properly long before the study of scales begins. The mass of piano methods --unfortunately mostly unread--provides us with some very helpful and diverse pre-scale exercises. Some of them will be mentioned in Chapter V, p. 50.

²Detailed analysis of each factor suggested is given in József Gát's The Technique of Piano Playing (London: Collet's, 1980), pp. 131-32.

The development of such an elaborate skill as piano-playing is plagued with misunderstandings. The teacher should try therefore to be very exact in his terminology and never to lose sight of the student's advancement. This advice was already given to us by François Couperin in his L'art de toucher le clavecin. In order to prevent his students from acquiring bad habits, Couperin used to lock up the harpsichord at the end of each lesson, thus depriving the young student of any chance of "unlearning" what he has just been told.³

Symptoms of Double-Jointedness

In the Advanced Piano-Student

While playing, the double-jointed piano student seems to be totally relaxed: the hands move easily at the keyboard and the wrists seem to be completely flexible. However, critical observation of the hands and arms reveals a too-relaxed action of the fingers and an increased tension in the forearm and the elbow-joint whenever a special effort is needed. (See Example 17.) Pianist William S. Newman explains the last symptom as "an attempt

³ François Couperin, L'art de toucher le clavecin (Paris: St. Gervais, 1717; reprint ed. Wiesbaden: Breitkopf & Härtel, 1961), p. 15.

to transfer the responsibility from the ill-functioning hand all the way back to the trunk."⁴

Ex. 17. Tension in the forearm and in the elbow-joint as symptomatic of a lazy finger-action.



The hyper-relaxed action of double-jointed fingers has given them the popular name "macaroni-fingers." Contrary to the symptomatic "slowness" of the opposite, abnormal articulation--stiffness in the joints--the "macaroni-fingers" are capable of playing fast. Though the speed is there, the playing lacks precision, clarity and rhythmic accuracy--three important factors the combination of which creates brilliance.⁵

⁴William S. Newman, The Pianist's Problems (New York: Harper & Row, 1974), p. 48.

⁵Renowned pianist Josef Hofman used to say, "Brilliance results from clarity, not from speed." See Abram Chasins, Speaking of Pianists (New York: Alfred Knopf, 1958), pp. 20-21.

The symptoms of the double-jointed pianist's playing are a tendency to a superficial sound, lacking in firmness and depth, a lack of rhythmic precision, and hysterical use of the pedal in compensation of the inability to function in trills, tremolos, and runs. Some sharp observations on the playing of the hyper-flexible hand were made by Liszt's secretary, French pianist Marie Jaëll (1846-1925):

The activity of the hands is guided by a compensation of two forces: the suppleness and the weight. The weight represents immobility, suppleness represents the facility of changing positions without which this immobility may be useless. The study of movement creates an improvement by increasing the mutual influence of those two guides. One can agree to the principle that people with hyper-flexible hands do not have enough judgment over the many changes of positions taken by their hands. Through the study of movements, one can teach the force of immobility to hyper-flexible hands by the dissociation of the fingers.⁶

⁶"L'activité des mains est agencée par une compensation de deux forces: la souplesse et le poids. Le poids représente l'immobilité, le souplesse représente la faculté de diversifier les positions sans laquelle cette immobilité ne pourrait nous être utile. L'étude du mouvement crée le progrès par ce fait qu'elle agrandit l'influence réciproque de deux agents.... On peut admettre en principe que les personnes aux mains très souple ont relativement peu de jugement sur les changements de pose multiples que leurs mains peuvent prendre. Grâce à l'étude des mouvements, on peut communiquer la force d'immobilité aux mains très souples par la dissociation des doigts." Marie Jaëll, La mécanique du toucher (Paris: Felix de Couppey, 1897), p. 32.

Some other remarks were made by Jaëll's disciple,
French pianist and pedagogue Blanche Selva (1884-1924):

This is why the naturally flexible hands do not understand facility together with precision. In some way, they do not learn well. This comes from a lack of both mental fixation and energy of volition. Their natures flirt with ease and, in a seducing manner, they rarely make the effort necessary for reaching the basis of their personal source. . . . They only move part of the surface.⁷

⁷"C'est pourquoi les mains souples naturellement ne realisent pas facilement avec précision. En quelques sorte, elles n'apprenent pas. Cela provient d'un manque de fixation cérébrale, d'énergie de la volonté. Ces natures effleurent avec aisance et de manière séduisante, elles ne font que rarement l'effort nécessaire pour arriver jusqu'au bout de leurs ressources personnelles.... Elles ne meuvent qu'en surface." Blanche Selva, L'enseignement musical de la technique du piano (Paris: Rouart, Larolle et Cie., 1925), p. 19.

CHAPTER V

HOW TO CONTROL DOUBLE-JOINTEDNESS IN PIANO PLAYING

Creating New Awareness for One's Fingers

The first stage toward control of double-jointedness is to make the pianist aware of his hand and its capability to function as one grasping unit.

A re-evaluation of the grasping capacity of the hand may be done by squeezing an elastic object with all fingers, letting the elasticity of the object re-extend the fingers. By accustoming the hand to holding and grasping, we develop the flexors without at the same time developing the extensors--thus turning the balance of muscular pull toward the palmar side of the hand.¹

The second step is a development of the pianist's permanent sensation of his fingers and especially of the finger-tips. This sensation could be gained by a controlled

¹This exercise is recommended by Otto Ortmann in his monograph The Physiological Mechanics of Piano Technique (New York: E. P. Dutton, 1929), p. 330.

increase of flexion in the hand. He must educate himself never to "break" any joints of his fingers. The finger should be conceived as one unit, from the knuckle to the finger-tip.

The most difficult idea to teach in this physiological-psychological re-education process is that the fingers can grasp firmly without disturbing the flexibility of motion in the wrist. Use of an artistic image could be of help here. The Rumanian pianist Mindru Katz used to say that a pianist's hand should be held as if there were a young bird there. One does not want to hurt the bird, and yet the touch should be firm enough not to let it go.²

Some Notes on the Special Importance of the Exercises for Double-Jointed Players

A solid piano technique involves functioning in a state of controlled tension. The amount of intensity and relaxation implied in that state is to be determined by the performer.

The ill-functioning fingers of the double-jointed pianist are in a state of uncontrolled relaxation. They are incapable of a firm, precise action. Their weakness and

²This writer was Mindru Katz's piano student during the years 1974-1978.

hyper-flexibility make them move around too much, jerking, sliding, slipping and changing positions without any voluntary plan.

A technical reform of these fingers would imply development of their strength, limitation of their articulation surfaces, and prevention of an arbitrary "flying" on the surface by insistence on economy of gesture and immobility whenever change of position is not necessary--all this without losing the flexibility of the wrist and with great care not to overstrain or reach the borderline of the opposite, extremely dangerous state--that of an uncontrolled tension.

While executing these exercises the pianist should be constantly aware of two controlling centers: the wrist and the knuckles. The wrist is always to be kept free, loose, and flexible. A stiff wrist indicates that the permanent flow of energy from the trunk to the fingertips is stopped, and therefore causes unnecessary tension which may accumulate into uncontrolled tension symptoms: tendinitis, strained tendons, carpal-tunnel syndrome.³ Well built-up knuckles in the hand's arch indicate that the fingers are strong and independent enough to take care

³Those symptoms are the most common complaints of pianists seeking medical help. See Robert Silverman, "Physician's Views of Physical Problems," The Piano Quarterly 120 (1983):42-44.

of the energy and arm-weight transferred to them through the flexible arm and wrist. That simultaneous combination of a solid arch with flexible wrist is therefore the basis for a healthy piano technique.

In coping with hyper-relaxation, attention should be given to the incorrect, though unfortunately very popular use of the word "relaxation." Practically, there is no total relaxation in piano playing.

The term relaxation . . . tempts those who want simple answers to see in it a panacea to cure all evils. . . . Some muscles must be active (and, therefore, unrelaxed) while others rest.⁴

What is usually meant by the use of the word "relaxation" is that certain areas should be relaxed in order to let other areas function without disturbance. The double-jointed pianist should never relax his fingers (from the knuckles to the finger-tips) because that "relaxation" would enable him to "break-in" at various joints, and it is that tendency which is detrimental to his playing.

Some of the exercises mentioned here (finger gymnastics, arm-drops on firm fingers, tied exercises, pressure exercises) are designed particularly for the hyper-relaxed hand. Supervised practice of these exercises is recommended in order to avoid dangerous tension. Other

⁴Louis Kentner, Piano (New York: Schirmer Books, 1976), pp. 60-61.

exercises mentioned (scales, arpeggios, double-notes) are important to all pianists, but are extra important for the double-jointed players, since they provide excellent tools for gaining control over the hyper-relaxed fingers.

Finger Gymnastics

Traces of the use of gymnastic exercises reach as far back as François Couperin's L'art de toucher le clavecin.⁵ Couperin writes that

People who begin late or have been badly taught must . . . take care to make their fingers flexible or to have them made so before sitting down to the harpsichord; that is to say, they should pull their fingers in all directions, or get someone else to do it for them.

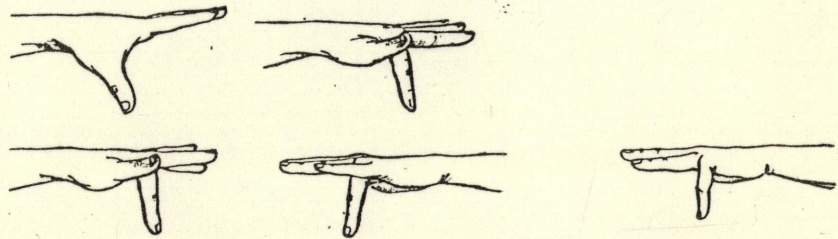
Flexion exercises with a loose wrist

1. Slow controlled flexion and gradual extension of each joint: flex the finger-knuckle down as much as one can and then extend it back slowly (the slower the performance of this exercise, the more control one acquires);

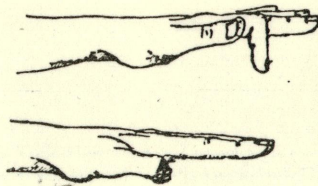
⁵"Les personnes qui commencent tard, ou qui ont été mal-montrée...elles doivent se dénouer, ou se faire dénouer les doigts par quelqu'un avant que de se mettre au clavecin; c'est-à-dire se tirer, ou se faire tirer les doigts de tous les sens." François Couperin, L'art de toucher le clavecin (Paris: St. Gervais, 1717; reprint ed. Wiesbaden: Breitkopf & Hartel, 1967), p. 12.

perform the same exercise with the nail-joint (if one can do it without "breaking-in" the middle joint) and with the middle-joint. This exercise should be executed with a straight closed hand position. Pay attention to a firm state of the finger-tip! Check its firmness with the other hand. (See Examples 18-19.)

Ex. 18. Flexion of the knuckles in all five fingers successively



Ex. 19. Flexion of the middle-joint of the second finger, and of the thumb's nail joint



2. Simultaneous flexion of two parallel joints in two fingers, for example, the middle-joints of second and fourth fingers. (See Example 20.) Perform this exercise in all possible combinations of parallel joints, and keep insisting on firm finger-tips.

Ex. 20. Simultaneous flexion of middle joints in the second and fourth fingers. The other hand checks the firmness of the finger-tips.



3. Bending single finger at various joints (the same as no. 1) with simultaneous up and down motion of the wrist. Keep checking the finger-tips. (See Example 21.)

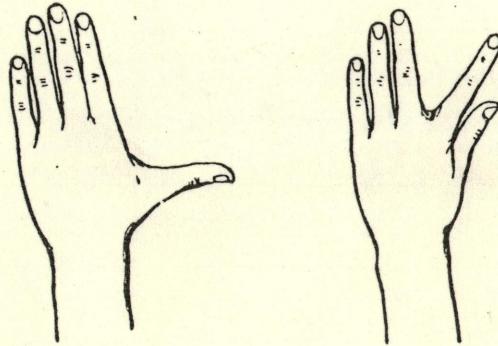
Ex. 21. Flexion of fifth finger's knuckle, with simultaneous up and down motion of a constantly flexible wrist. The other hand checks firmness of the finger-tips. The non-participating fingers remain immobile.



4. Extensions in lateral motion (scissors-like movements): Extend the thumb (its nail-joint bent) in a lateral movement away from the second finger. Keep the hand in straight position, the arm lying passively by the side of the body. Repeat the same movement, extending this time the second finger from the third, the third from the fourth (more difficult) and the fourth from the fifth. (See Example 22.) While maximum extension is reached between each pair of fingers, move the wrist up and down without affecting the amount of extension achieved and the firmness of the fingertips. Remember that fingers

not involved in the lateral extension should remain completely quiet and immobile.

Ex. 22. Extensions in lateral movements
between pairs of fingers



At the Piano

Arm-drops on firm, well-prepared fingers

The purpose of this exercise is to strengthen the double-jointed fingers, and to make them solid enough to sustain the arm-weight without transferring the responsibility to any other components of the arm. There are three stages to this exercise:

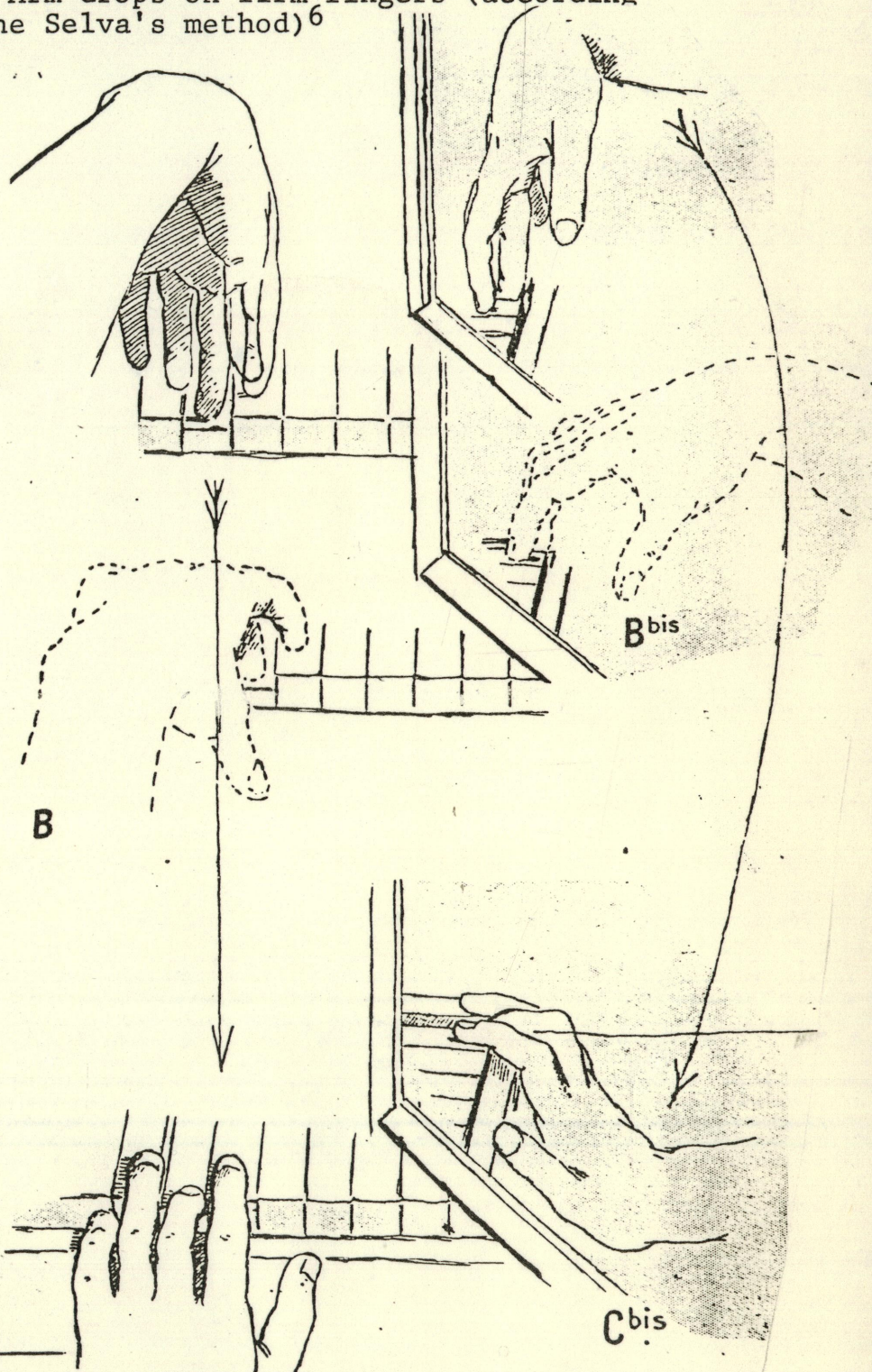
1. Arm-drops on a single finger: drop the arm on a firm, well-prepared finger (straight or slightly bent). Once one has pressed the key down, drop down the wrist without releasing the finger, thus continuously feeling the arm-weight's pressure on the finger-tip. Watch the solid bent-position of the finger, and check the firmness

of each finger-joint with the other hand after the drop. (See Examples 23-26.) Drops should be done both on black and on white keys. Pay attention to the functioning of the second, fourth, and fifth fingers as units on black keys.

2. Arm-drops on intervals and chords. The basic demands of the exercise should remain the same: well-prepared fingers; immediate dropping-down of the wrist; no change should occur in the placement of the fingers on the keys after the drop. In order to control the preparation of each finger in the chord (or interval) diverse voicing is suggested. (See example 27.)

3. Transferring weight from one finger to the other in two-note pairs: the first tone should be produced as described in no. 1. While relaxing the wrist after the drop, prepare the other finger; lift it slightly above the neighboring key, press the key down and release the key by lifting your wrist up. The preparation of the second tone of the pair should be carefully planned, avoiding any movement except that of the finger knuckle. (See Exx. 28-29.)

Ex. 23. Arm-drops on firm fingers (according to Blanche Selva's method)⁶

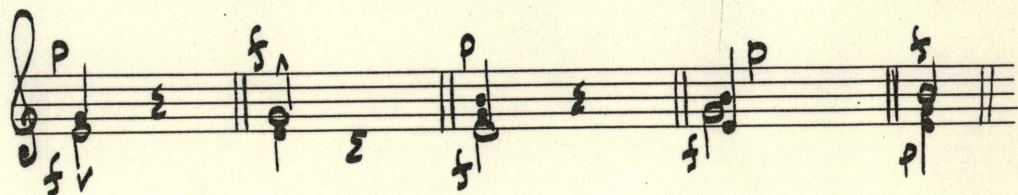


⁶Blanche Selva, L'enseignement musical de la technique du piano (Paris: Rouart, Larolle et Cie., 1925), p. 220.

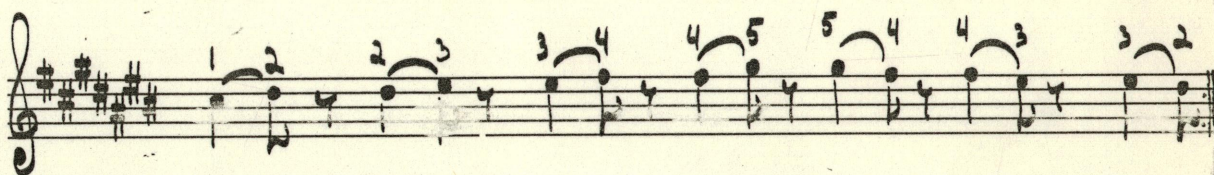
Exx. 24-26 show various stages in performance of the arm-drops: drop on a firm finger; immediate relaxation of the wrist (but not of the finger); checking the firmness of the joints with the other hand.



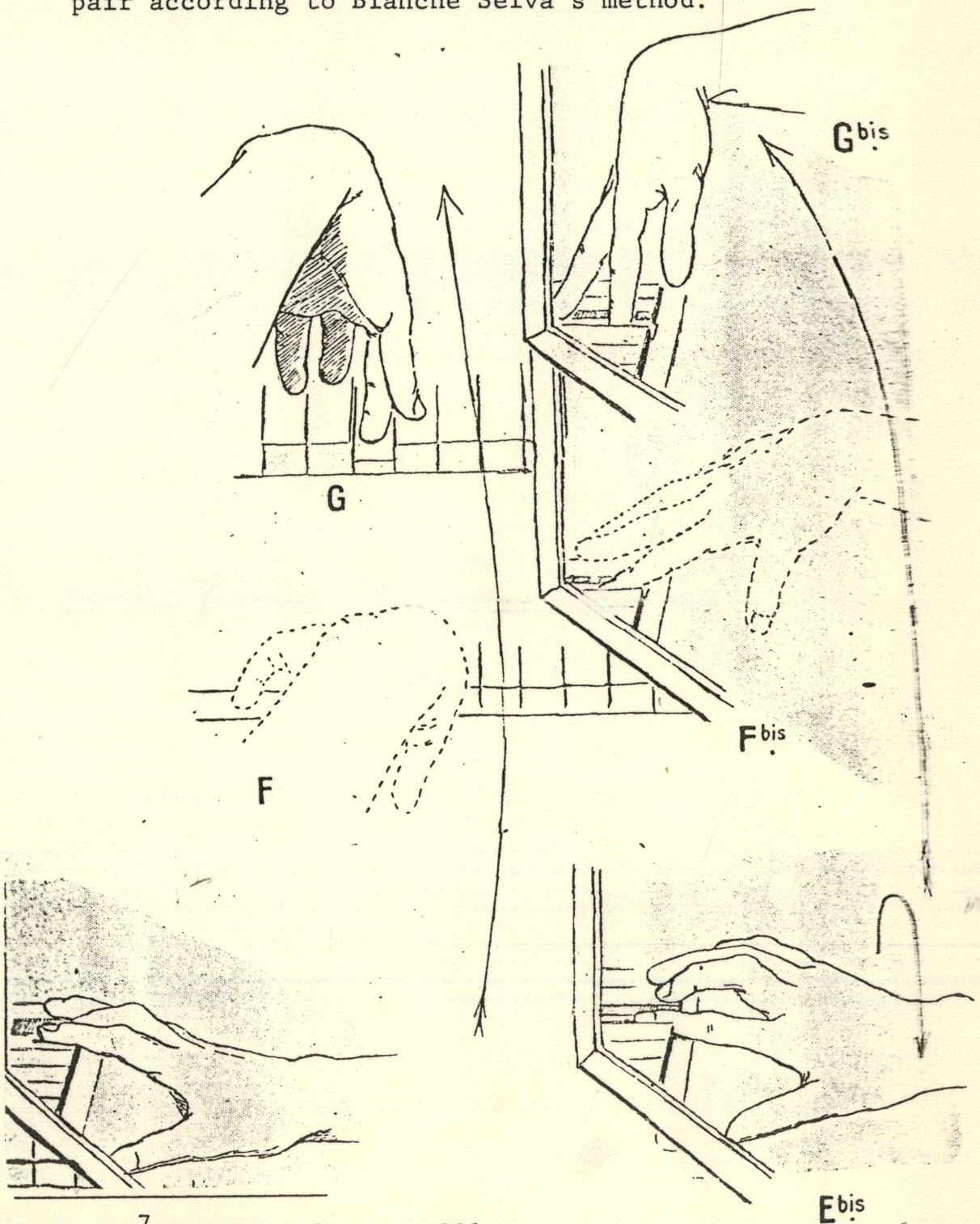
Ex. 27. Voicing in drops on chords and intervals.



Ex. 29. The two-tone pairs in C-sharp major.

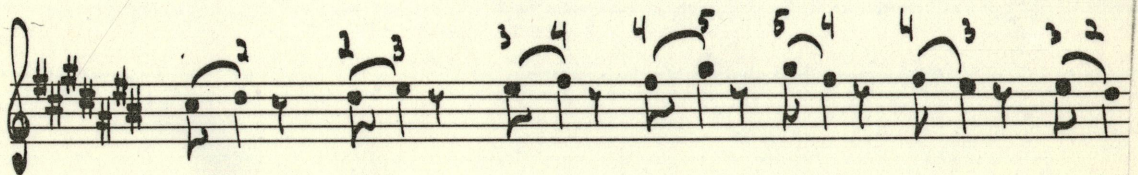


Ex. 28. Execution of the second tone of the two-note pair according to Blanche Selva's method.



Once one masters the exercise, reverse the procedure. Start by slightly lifting a finger and pressing down a key; release the key by lifting the wrist and drop the arm on the neighboring tone. (See Example 30.)

Ex. 30. A variant of the previous exercise.



A third stage of performing this exercise would be the expansion of the two-tone pairs into three, four and finally five-tone patterns. (See Example 31.)

Ex. 31. Five-finger exercise based on two tone pairs.



The two-note pair is kept, but there is more finger-work to be done between the two notes. When the additional notes are played, the arm should stay passive and the finger-knuckles should perform the action, in collaboration with a gradual lifting of the wrist from a low position in the first note, to a high position in the fifth note.

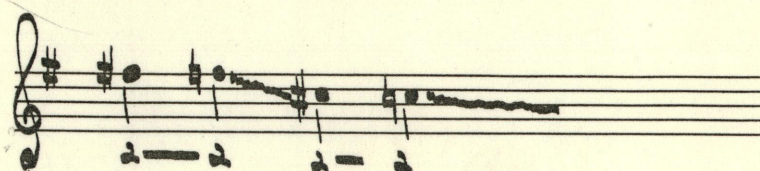
Repetitions and glissandos of a single finger

The purpose of this exercise is to increase endurance of one finger controlled from the knuckle to perform various movements. The responsibility for execution of the action should be left to the finger alone. The wrist should stay passive and flexible. Perform the exercise (see Exx. 32 and 33) with each of the five fingers.

Ex. 32. Repetition of a single finger.



Ex. 33. Glissando and glissando scales performed by a single finger.



Alternation of two fingers: trills and tremolos

Alternation of two fingers should be studied only when one is certain that each of the ten fingers is strong enough to perform perfectly as one unit, from the knuckle to the finger-tip. Only when the double-jointed pianist is sure of that may he try to alternate fingers. This writer recommends use of Hanon's adaptation of Mozart's and Thalberg's trill exercises. (See Example 34.) Pay attention to an always firm nail-joint in the "too" loose second finger and firm knuckle and nail joints in the fourth and fifth fingers. Practice in triplets is recommended for evenness and clarity.

Ex. 34. Trill exercises.

The image shows a page from a music book with two systems of musical notation. Each system consists of a grand staff (treble and bass clefs) and a central text label. The first system is labeled 'MOZART' and the second is labeled 'THALBERG'. Both systems feature complex rhythmic patterns, including triplets and sixteenth notes, and are marked with various fingerings and articulations. The notation is in black ink on aged paper.

MOZART

THALBERG

Use all possible fingerings for execution of tremolos, and practice them in triplets in the same manner shown in Example 34.⁸ Though rotary motion (coming seemingly from the forearm, see Chapter II, p. 6) is of great help, it is also the easiest, yet not the best way out. Try to do as much as possible with firm and solid finger-work and add rotary motion only when this work is properly done. Do not move around too much! Economy of movement is the basis of every good piano technique.

Pressure exercises

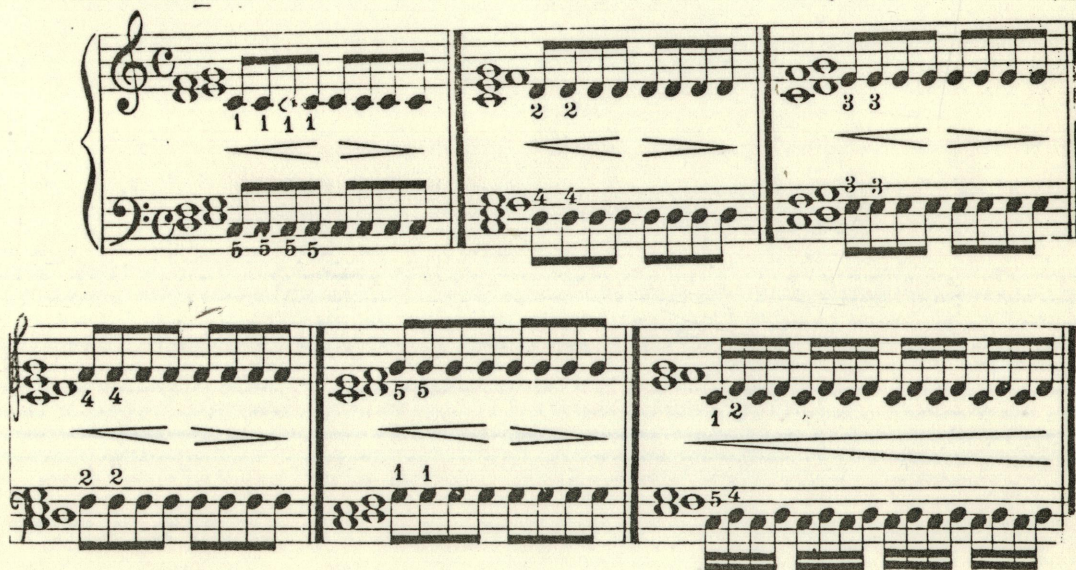
With your hand in an arched position, fingers resting on B, F-sharp, C-sharp, A-sharp, C, successively press each finger down to the bottom of the key, and then drop the wrist down. The arm weight should be felt on the finger-tip of the operating finger and its knuckle should be firm (not "caving-in"). The "digging in" of the finger should only be stopped when another finger takes action. Watch the elbow-joint. It should not stick out when a key is pressed all the way down. (See Example 17 in Chapter IV, p. 39.)

⁸ See C. L. Hanon, The Virtuoso Pianist in Sixty Exercises (New York: G. Schirmer Inc., 1928), p. 77.

Tied exercises

This writer is well aware of the danger implied in the practice of tied exercises. (See Example 35.) Yet, the importance of those exercises in strengthening the fingers and making them capable of independent action is so crucial that they are really irreplaceable. Each exercise should at first be practiced very slowly and repeated several times, gradually accelerating the movements, as the strength and flexibility of the fingers develop. The player must be careful not to overstrain and always to relax the wrist.

Ex. 35. Tied exercises according to the Henri Herz Method⁹

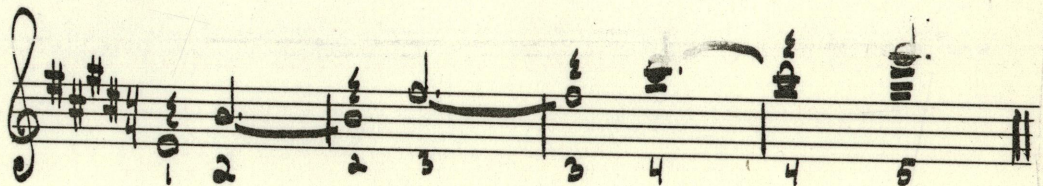


⁹ Henry Herz (1802-1888) was the piano teacher of Marie Jaëll. The exercises are taken from his book Scales For Piano (London: Augener, 1877; reprint ed. New York: Carl Fischer, 1903), p. 3.

Extension exercises in lateral movements

Extension exercises in lateral movements are extremely important for mastering Romantic piano technique.¹⁰ The flexibility of the double-jointed hand enables it to stretch, but the weakness of the fingers limits the sound and clarity. The extension exercises given in Example 36 are to be executed with strong finger-tips yet with an always flexible wrist. There should be no participation of the arm in the effort.

Ex. 36. Extensions exercises



The staccato problem

A common misunderstanding of the staccato by double-jointed pianists involves the idea that a short, light tone calls for a "looser" finger stroke. While practicing staccato one should always bear in mind that the fast

¹⁰Paul Creston emphasizes the importance of lateral finger movement in his valuable exercises. They are found in his book Virtuoso Technique for the Piano (New York: Schirmer, 1950), pp. 1-5.

release of the key does not imply any release of the finger-tip. The staccato study should start with finger-staccato, and wrist-staccato should be added only after the finger-staccato is properly mastered. One may use melodic patterns of arpeggios and scales for practicing different types of staccato.

Scales

The passing-under of the thumb should be mastered before practicing scales.¹¹ Practice of scales is doubly important for the uncontrolled fingers of the double-jointed pianist. He should be careful not to let the passing-under of the thumb influence the arch-position of other fingers (as already seen in Chapter II, p. 15). The pianist is also advised to make an exercise of combinations of notes played by the third, fourth, and fifth fingers in the scale.

Arpeggios

As mentioned above, the problematic aspect of the arpeggio for a double-jointed pianist will be to keep the arch-position of the hand when passing the thumb under.¹²

¹¹ See Hanon, pp. 43-47.

¹² See Hanon, pp. 65-71.

Double-notes

Double-notes are extremely important for strengthening the double-jointed pianist's fingers and using simultaneously the flexibility of the wrist. Start slowly, paying maximum attention to your outer voices; try to make the best legato in the soprano and bass by controlled preparations, always predicting the following interval's fingering. Try to keep the hand in one line and avoid big skips in and out of the keys. When speed is increased absolute legato becomes impossible. An even non-legato should be properly performed.

Choice of Etudes and Bravura Pieces

There is no short cut. One cannot go around or under the mountain. One must climb over it. . . . I do not see how one can climb over the great mountain of modern technique at a less speed than two hours a day. Otherwise, they would be old men and women before they could hope to compare with others in these days of enormous technical competition. Everybody knows that technique is only a means to an end but without this means one does not reach the end.

In addition to performance of the daily exercises, one should pick some etudes or bravura pieces, chosen to become part of daily practice during a certain period of time (up to four months per piece). The bravura pieces offer a technical as well as musical challenge, which should

¹³ Josef Lhévinne, Basic Principles in Pianoforte Playing (Philadelphia: Theodore Presser Company, 1924), p. 143.

arouse the appetite of every piano student. One cannot promise that the student would be able to play them soon in concert, yet one thing is obvious: the student will learn a great deal about himself and about what it means to practice well.¹⁴

Choice of etudes for the double-jointed pianist should be carefully thought about. The technique explored in the first group of pieces should rather be controlled finger etudes (Czerny, Clementi, etc.) than heavy fireworks of chords and double-notes. One must not forget that we are dealing here with too-flexible, hyper-relaxed fingers. One should deal with controlled suppleness and immobility before going on to "heavier" technique.

Once some finger etudes are mastered (for example, Mendelssohn's in F Major op. 104 and Chopin's op. 10 nos. 4 and 6), a combination of finger techniques with wrist staccato is recommended (perhaps Liszt's "La Campanella"). "Dexterity in execution depends much more on suppleness and great freedom of the fingers than on force,"¹⁵ and therefore controlled suppleness should be developed first, and after these rudiments of piano playing seem to become second nature to the double-jointed pianist, heavier chords and double-notes could be studied.

¹⁴See William Westney, "Pianistic Bravura: Can It Be Taught," Clavier 1 (1980):28-33.

¹⁵Couperin, pp. 11-12.

CONCLUSIONS

The readers, who have been kind enough to follow me from the beginning until now, may be asking themselves what is the musical end of the story. Indeed, in the last forty pages there were many exercises and technical terms and the listener's art seemed to be forgotten.

As stated already in the Preface, this study is designed to provide the double-jointed pianist with working material for technical reform. During this time, much of the performer's attention must be drawn to physiological details, which are being presented to him for the first time. Yet, as Russian pedagogue Heinrich Neuhaus used to say,

I, as a musician, express my attitude to knowledge by saying that everything that can be learned is musical. . . . all knowledge is musical (for a musician, of course); all knowledge is at the same time an experience. . . ; it belongs to the sphere of music and inevitably enters its orbit.

It is this writer's belief that through those exercises a new image of sound will emerge. The double-jointed pianist will be attracted to the new clearly

¹Heinrich Neuhaus, The Art of Piano Playing (London: Barrie & Jenkins, 1973), pp. 27-28.

articulated sounds his fingers are beginning to be able to produce. The muddy texture will be replaced by a well organized and clear one. It is the fascination of the new beautiful sounds which will guide the pianist's way once the reform period is over and he starts making music again. Hopefully, he will then find his technical equipment more responsive to his inner hearing.

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