A NEGLECTED SENSE IN PIANO-PLAYING

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PREFATORY NOTE

For the underlying idea here presented, and for many features of its development, the author wishes to record his indebtedness to Mr. Edward J. de Coppet, well known as the founder of the Flonzaley Quartet. Mr. de Coppet himself is a striking example of the practical usefulness of his method. Playing the piano desultorily all his life, he never acquired a skill in any degree commensurate with his musical taste until, at fifty-five, he thought out the way of attacking the problem through the tactile sense which is set forth in the following pages. The rapid progress he then made in facility and accuracy convinced him of the value of the idea, and made him anxious to disseminate it, for the benefit of piano-students, as widely as possible.

CONTENTS

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Painful Uncertainty of Amateur Playing

If we compare the piano-playing of the average amateur, whatever his degree of skill, with that of even slightly advanced professionals, we shall usually find his most serious shortcoming to lie in the uncertainty of his results. He can never tell how he is going to play. When "in the mood," as he calls it, he may give a satisfactory performance; but at other times, for little or no reason, confused by the presence of strangers, by an unfamiliar piano or chair, or even by a change of furniture or light arrangement, he will go quite astray,

stumble helplessly over the keyboard, and end with the mournful or bitter apology, "I can't do anything to-day," or, "I played it perfectly only this morning." On the other hand the professional, though by no means insensible to upsetting conditions of all sorts, maintains a certain fairly high standard of efficiency. Even when he is nervously tired out or physically ill, he does not, as we say, "go all to pieces," but at least gives us the notes with some accuracy, if unable to infuse much life into their expression. He may be only mediocre at his best, but he will be tolerable at his worst. But the amateur, victim of this trying uncertainty, cannot be relied upon even to play badly.

Doubtless this uncertainty, which many fairly good players would agree to be the most discouraging defect in their playing, is in large measure simply the result of a lack of routine. They either do not practice enough, or they

practice fitfully and impatiently. But mere amount of time spent on work of any kind is never an index of the degree of success to be expected; too much practice may dull rather than sharpen the faculties; and far more fundamental than the routine itself are the mental habits it induces. The more we investigate the question, the more irresistibly we shall be led to the conclusion that the superior reliability of some players depends on their employment, sometimes consciously, but far oftener unconsciously and instinctively, of a sense which others neglect. The foundation of accurate piano-playing, we shall come more and more to feel, is a sense of touch naturally so delicate and through training so highly discriminating that it is capable of guiding the hands and fingers through the labyrinths of the keyboard with only slight and casual aid from ears and eyes. On this tactile sense, rather than on vision or even on hearing, should the player

chiefly depend. The degree of his dependence on it will be the measure not only of his accuracy, but of other fine qualities of performance to which we shall later return.

Desirability of Tactile Guidance

It is possible to divide pianists into two strikingly contrasted types, on the basis of their neglect or use of this highly important tactile sense. Painfully familiar is the player of the first type, the conscientious but improperly trained bungler. He is usually recognizable by his air of having an insecure and precarious contact with the instrument. He is apt to sit before it as he might at a table, and merely tap or strike the keys, instead of making so firm and yet sensitive a contact between key and finger-tip that the current of nerve-force from brain to piano-string has an unbroken path to travel. He has constantly, therefore, to guide himself by his sight, and whenever his eye fails to gauge a distance correctly, or when it is deceived by unaccustomed

lighting, or when it is detained by attention to the printed music or to the audience or any other object, he fumbles the passage, gets confused, and takes perhaps some time to get placed and started again. He is almost helpless if he tries to play in the dark; he is subjected to wearisome distractions of attention whenever he tries to read, because when he looks at his hands he loses his place and when he looks at the music he hits the wrong keys; and even under the best conditions, when he is playing from memory in a familiar room with a good light, he is still at a disadvantage, because he is trying to govern his fingers from a distance, instead of teaching them to govern themselves on the spot.

What a contrast is this other, who has developed his touch-sense to a point at which he can largely depend upon it! There is an inimitable ease, fluency, and precision about his performance. The keyboard is to him a

pleasure-garden rather than a trackless desert, because he has taught his mind to go down into his finger-tips and govern all that they do. He is nowhere so thoroughly at home as at the piano. He can give his undivided attention to the notes if he wishes to read. When playing from memory he can look at the audience, if he is a de Pachmann, through the whole of a piece full of leaps in both hands if it suit his humor; — or, if he is a Paderewski or a Gabrilowitsch, he may pick out a blank space of wall or cornice whenever he wishes to give undivided attention to the noble musical structure he is building up, undistracted by moving faces or jiggling keys.

The precise degree of dependence thus placed upon the tactile sense by the great concert pianists we are apt not to realize, because of their habit, in the absence of printed music to look at, of focussing their eyes apparently on the keyboard. This is, however, largely for

the sake of resting the eyes somewhere, rather than letting them wander distractedly about; and the actual vision of the keys is less than we suppose. On such vision the player depends but in slight measure. Not only does he frequently look away entirely for long periods, but he is usually able, if put to the test by such an accident to the lighting plant of a hall as has been known to happen, to play on with perfect ease in the dark. There have been also many skilled pianists among the blind, who of course had to depend exclusively on the touch-sense. If we try to imagine what would be the effect produced on any pianist, of whatever degree of skill, by injecting an anæsthetic into the finger-tips and the principal joints of hands and arms in such a way as to produce anæsthesia without impairing the muscular power, we shall realize at once that no delicacy of vision would compensate for the lost tactile guidance.

The Tactile Sense Latent in all Pianists

THE sense to which the accomplished player thus entrusts so fundamental a part of his work, developing it meanwhile, of course, in the ratio of his dependence upon it, is present also, in however crude a condition, in the veriest tyro. All it needs is to be educated, to be drawn forth and perfected by use. There is hardly a beginner who, having struck *C* and *E*, needs to look at the keyboard before he can strike *G*, or who would hesitate to strike an octave with his eyes closed. Such simple applications of the sense as these become automatic in the earliest days of our piano experience; but unfortunately it is so easy to depend on the eyes when jumps exceeding the hand-reach are necessary, that our natural laziness leads us to do

so, unaware that we are thus leaving an invaluable faculty undeveloped. The same result of indolence is to be seen in players of the guitar and the banjo, who frequently look at the frets as they finger. Violin-players, on the contrary, having no frets to look at, are obliged from the beginning to depend much more on the touch-sense, and consequently often possess it in the highest degree of perfection. Similarly, all organ students try, during their first lessons, to look at the pedals. But as in order to do so they have to twist and turn most inconveniently, and as good teachers discourage the habit, they soon come to pedal entirely by feeling, which is, of course, the only proper way.

Since this paper was begun, the writer has been much interested to learn that at Teachers' College, Columbia University, typewriting is taught by a method similar to that here advocated for piano-playing. From almost the

very beginning the pupil is prevented from seeing the keys by a screen, and thus obliged to locate them by his tactile sense alone. But the piano student has no such external safeguards against temptation. If he would develop to the utmost this sense so indispensable to the pianist, he must understand at the outset its importance and its mode of operation, and study ceaselessly to secure in his practice conditions favorable to its growth. Thus substituting for the hit-or-miss way in which it is acquired, as a by-product and unconsciously, in the ordinary modes of practicing, a method which aims at a conscious, regular and progressive development of it, he will find that, spasmodic and unreliable as it may be at first, it will gradually assert itself as the one constant, unfailing guide for all that he has to do.

How it may be Developed

ALTHOUGH we have so far spoken of this tactile sense as if it were *one* thing, a little analysis will show that it is really *two*. First, there is the tactile sense proper, the sense of touch in the finger-tips by which they ceaselessly explore the keyboard, finding their way about by observing the landmarks of the black keys grouped alternately in twos and in threes. Secondly, there is the sense of space, either spanned by the fingers or traversed by the hand, which enables us to measure intervals without feeling of the keys. This, which we may call the *space-sense*, has been explained in various ways by the psychologists. It seems to depend on internal sensations of either the muscles or the surfaces of the joints, probably the latter (see James's "Psychology," Chapter XX), which if carefully observed are capable

of giving us remarkably accurate indices of the movements we make. It is a more subtle form of the tactile sense, which finds its seat in the internal articulations of hand and arm rather than on the surface of the skin.

Both of these elements of what we may still call, as a whole, the tactile sense are capable of surprising development through practice under proper conditions. The most important condition, and at the same time the one hardest to attain, is mental concentration. Not only are most students deficient in power of concentration in general, but what they have they are likely to give rather to more or less mechanical matters like the position of the hands than to *observing their touch-sensations*. This, however, is the capital matter here. The problem is, not to hold your fingers, or wrists, or elbows, this way or that, but to send your mind down into your finger-tips and joints, to notice each tiniest impression they receive so accurately that you

can reproduce at will the exact motion that gives rise to it. This requires the closest attention. The reward for giving it is that your advance becomes both rapid and solid. Fifteen minutes of such concentrated attention is better than days of strumming, for it is by trained sensitiveness rather than by brute strength that one becomes a pianist.

A second condition, scarcely less important than concentration, and of great aid in securing it, is complete dependence on tactile sensations, to the exclusion of visual ones. As the invalid cannot gain complete strength until he throws away his crutches, so the pianist can perfect his tactile sense only by refusing, at least temporarily, the aid of his eyes. Necessity is the best teacher; when we are obliged either to guide ourselves by touch or to strike the wrong keys, we find our tactile sense put upon its mettle in a way that develops it surprisingly. Moreover, by eliminating visual im-

pressions, we avoid a great many breaks in our attention that would be both mentally confusing to the tactile impressions we wish above all to make clear, and nervously exhausting through their constant interruption of our train of thought. Therefore, it is necessary for the best results to eliminate vision of the keyboard during the part of the practice-time specially devoted to cultivating the tactile sense.

It might be supposed that this could be done by a simple effort of will; one would simply resolve to look at the printed music, or at the ceiling, or anywhere but at the keys. One has only to try it, however, to find that looking at the keys from time to time is not a voluntary act, but an involuntary, automatic habit, so deeply rooted as to be practically irresistible. With the best will in the world, one cannot help giving a quick, surreptitious glance at the keyboard in an emergency. The best way, therefore, is to make it impossible to look,

either by playing in the dark or, what is better if one wishes to read music, by placing a screen between eyes and keyboard. The cover of an ordinary pasteboard box, such as tailors use for men's clothing, serves very well. It may be inserted, if the piano is a grand, under the music-desk, projecting horizontally toward the breast of the player and a little further than the keyboard itself, and will need no further support. With an upright piano a string or two will have to be added for security. It will hide only the four middle octaves, but that is enough, as the temptation to focus the eyes on the ends of the keyboard is one that can be resisted with comparative ease.

The moment the student sits down to the piano thus provided with a screen, he will find himself making a new kind of acquaintance with it, an acquaintance based on a hitherto neglected sense; and the novelty of the experience will lend it the fascination of a voyage

of discovery and adventure. At first, indeed, he will feel, as we say, "all at sea," and the keys may seem a boundless waste, uncharted and without landmarks. He will soon find, however, that he has in his space-sense a reliable guide, and that the channels are buoyed quite unmistakably by the black-key groups; and before he knows it he will be cruising about with an unwonted and delightful sense of freedom.

The Order of Practice

WHEN playing by touch it is, of course, absolutely essential to seat oneself in a definite and perfectly understood relation to the piano, so that one has a solid point of departure. To revert to the figure of the ocean we were just using, one must be well launched. There are many possible ways of doing this. A good way is to feel the left "cheek" or projecting side of the piano with the left hand, then swing in the requisite distance to the right to bring the little finger to the *C* two octaves below middle-*C*. This is done, of course, by the space-sense, which with a little practice will accomplish it reliably, especially as all that is necessary is to get the finger into the "pocket" between the *B* flat and the *C* sharp; the exact key is then found by the tactile sense of the little finger itself, pressing against the side of

the *C* sharp. From the *C*, once found, any other key may be easily reached by using the space-sense in the way presently to be described.

Perhaps a still better way to locate oneself is by means of the pedals, thus: Sit at any ordinary grand piano in such a position that the group of pedals is directly in front of you, which may be determined by finding the damper-pedal with the right foot, and the soft pedal with the left foot. The left hand rests on the left knee. Raise it to the keyboard, moving it the least possible shade to the right. The fingers will then pass directly into the middle-*C* "pocket."

Before proceeding to play pieces, however, the student will find it worth while to set aside a few minutes each day for preliminary exercises of three sorts, intended to cultivate sensitiveness and accuracy in Space-Measurement by the Hand, Recognition of Keys by Touch, and Space-Measurement by the Arm.

Space-Measurement by the Hand

THE object of these exercises is to cultivate the ability to adjust the finger-span to any desired interval or chord, as accurately and as quickly as possible.

EXERCISE I

Place the screen well to the right of the piano, so that the left half of the keyboard, from middle-*C* down, is visible. Holding the right hand in what seems the proper span to strike an octave with thumb and fifth finger, bring it to the keyboard, the thumb on middle-*C*. Observe by ear whether the upper tone is right. If not, correct it, notice the exact sense of stretch in the hand, and repeat. Later, try the same with thumb and fourth, third and second fingers successively. In the same order, strike a seventh; a sixth; a fifth; and

if the hand is large enough, a ninth and a tenth.

Smaller intervals, the second, third and fourth, should be tried in the reverse order of fingers: that is, beginning with thumb and second finger; then using successively third, fourth and fifth fingers.

Shifting the screen to the left half of the piano, try the same exercises with the left hand.

Beginners, and those who have paid little attention to their tactile sensations, may have to play each interval several times, on the visible half of the board, before they can be sure of it without seeing it.

It will be noted that this exercise affords an excellent form of ear-training in addition to the discipline for which it is primarily devised.

EXERCISE II

After some skill has been attained in the first exercise, it may be varied by holding the hand at first not stretched out at the span desired.

but with the finger-points lightly touching. The span is to be adjusted during the brief time in which the hand passes down to the keyboard. This affords good discipline in the quick adjustment of span which is constantly necessary in actual playing.

EXERCISE III

One may play in the same manner chords of three, four and five tones. With two screens, separated by an aperture of about an inch, through which one can see middle-*C* or some other key, one may play chords with both hands. In this case measurement is made, not only by the hands individually, but by that space-sense located in arms and shoulders which determines the distance between the hands. There is no need for discouragement if this develops rather slowly, as in actual playing it can usually be supplemented by the touch-sense, exploring the keys and pockets, or else

by a quick contact of the hands which clarifies the player's sense of his position. The present exercise is rather an artificially severe one.

Not more than five or ten minutes of the daily practice need be devoted to these exercises. Their usefulness resides largely in directing the player's attention to hand-span sensations, which are, of course, present in all the piano-playing he does.

Recognition of Keys by Touch

THE proper use of the touch-sense located in the epidermis of the fingers depends not so much on any extraordinary development of sensitiveness, such as is found in the blind, as on a well-founded habit of noticing, distinguishing, and being guided by the contacts of the black-key groups. The player who depends too much on vision is in large measure unaware of these contacts, and must accustom himself to meet and interpret them; he must form the habit of constantly exploring the keyboard. To this end one of the first requisites is relaxation, a muscular and nervous passivity that leaves the hands free to receive impressions.

Whenever we have to enter an unfamiliar room without a light we instinctively avoid all muscular rigidity. With slow steps and grop-

ing hands outstretched, we advance tentatively, and in a receptive mood, observant of the least incoming sensation that shall warn us of the whereabouts of table or chair, and save us from bumping our noses or stubbing our toes. Our study is not to act, but to be acted upon. If we imitate this attitude in our piano-playing, we shall find that the keys influence our fingers as much as our fingers influence the keys; that, in fact, the only way to be sure of pressing them effectively is first to submit to their guiding pressure. Through such a change of mental attitude from that of vigorous uncompromising assault which is so common we shall gain, not only relaxation and all its attendant benefits, but the invaluable sense of being at home among the keys.

EXERCISE IV

Removing the screen, close the eyes and place the hand on the keyboard at random, shaped to strike an octave, but without actually sound-

ing the tones. Let the three unengaged fingers explore the black keys beneath them until they recognize a group. It will be found that usually the easiest way to recognize a group is by spanning and gently pinching it, so to speak: if the fingers thus spanning it measure the interval of a third, it is a two-key group, *C* sharp and *D* sharp; if they measure a fourth, it is a three-key group, *F* sharp, *G* sharp, and *A* sharp. Still with the eyes closed, *form as vivid a mental picture as possible of the whole section of the keyboard under the hand.* Having thus determined what the octave about to be struck actually is, open the eyes and verify the result.

For example: Placing my right hand at octave-span on the keyboard, I find that the second and fourth fingers enter pockets, and that when the black-key group between them is measured it proves to be spanned by the interval of a fourth. At the same time I notice that from thumb to second finger is a

third, and from fourth to fifth finger also a third. The mental picture of the keyboard immediately flashes up, and I see my thumb and fifth finger on *D*'s, second finger on *F*, fourth finger on *B*. Or again: Placing the left hand in the same way, I find third and fourth fingers entering the same pocket. The fourth, exploring to the left, shows there a two-key group; the second finger finds a three-key group to the right. In fact, the fourth finger is on an *E*, and as the little finger is distant from it a third, the octave I am holding is that of *C*.

All this will sound at first highly complicated, and the student may feel that if he were to crawl about thus on the keyboard in actual playing he would have to take everything at snail tempo. He will soon find, however, that in this exercise he is merely carrying out consciously a process which he has always used to some slight extent and subconsciously, and that what he is now doing is simply increasing

his sensitiveness by sharpening his attention. The exploration of the keys by the non-playing fingers will soon become instinctive again, but with a much higher efficiency than at first. These ever-active sentries will constantly be telegraphing to the brain information of their whereabouts, which will enable it to direct the playing much more accurately than if it had to depend on irregular, desultory observations, or on the eyes.

Space-Measurement by the Arm

WHEN the hand has to rise entirely from the keyboard, travel to right or left, and descend again, striking a chord immediately without any preliminary finger-exploration, it is making the most difficult application of the space-sense that it is ever called upon to make. The sensations involved in such an act reside in elbow and shoulder-joints, and are far less depended upon in ordinary eye-guided piano-playing than either those of hand-joints or finger-tips, and consequently less trained to be serviceable as indices of movement. They are, however, used to a considerable extent in the case of the left hand, which is often required to play waltz accompaniments, and the like, where the bass notes are at a considerable distance from the others and have to be taken quickly. The student will accordingly find that his left

arm is able to measure accurately much larger intervals than his right — perhaps as much as an octave and a half or two octaves — without any special practice. Such special practice is far more necessary to the right arm, because the right hand plays melody nine-tenths of the time, and melody is made of small intervals manageable by hand-span and finger-touch sensations.

EXERCISE V

PLACING the screen over the right half of the keyboard, leaving middle-*C* visible, place the right hand on the chord middle-*C*, *E*, *G* and *C*. Passing the whole hand and arm smoothly and quietly to the right, with little upward motion away from the keys, strike the same chord just one octave higher. Repeat several times. Then strike the chord *G*, *B*, *D*, *G*, a half-octave higher still (beginning with the original chord each time). Finally, find in the same way the chord *C*, *E*, *G*, *C*, two octaves above the chord of departure. The same exercises may be

tried with the left hand, but will require much less practice.

In working out these exercises the student will be surprised to notice how hard it is for him to overcome a tendency to feel the keys before he comes down upon them; in other words, *how instinctive is the use of the finger-touch-sense as a guide or corrective for wide leaps.* As a matter of fact, there are comparatively few wide leaps necessary in actual playing that do not allow of this kind of correction. The exercise is, therefore, like Exercise III, somewhat artificially difficult. Practically, it will usually be possible to get some hint of one's position, after a long leap, from the finger-sensations, perhaps in the very instant of playing the chord. Nevertheless, this is sometimes impossible, and the player will find that an accurate sense of space-measurement by the arm will give him a freedom and certainty in playing such modern music as that of Schu-

mann, Chopin and Brahms that he can get in no other way.

The works of Schumann and Brahms are especially rich in passages that may be used for practice in the development of this sense. The section in *E* flat towards the end of the former's "Faschingsschwank aus Wien," first movement, for instance, affords invaluable discipline in jumps of an octave simultaneously in both hands; any one who can play this without errors, with his eyes shut or with the screen, may feel that he has already acquired a very respectable command of the arm-space-sense. The second movement of the Phantasie, opus 17, presents many similar opportunities. As for Brahms, large leaps are one of the hall-marks of his style, and almost any of his pieces will yield passages for this kind of practice. The Rhapsodie, opus 79, No. 2, and the Intermezzo, opus 116, No. 4, contain much interesting crossing of the hands.

Application of the Tactile Sense in General Practice

THE foregoing exercises are to be considered as merely preparatory to the daily practice; their main object is to focus the attention successively on the three kinds of sensation that are involved in a full use of the tactile sense; once this is accomplished, it will be found that the general practice of pieces will carry on, even better than the exercises, the discipline they have begun. Comparatively little time, therefore, need be spent on the exercises themselves; but the attitude of mind they engender should be carried through all the other work.

Suppose, for example, you are studying the Brahms Rhapsodie in *G* minor just mentioned. Having adjusted the screen, you take your seat, find the damper-pedal, and placing the right hand on the keyboard almost directly

above but the least bit to the left, find the two-key group near middle-*C*. This gives the *D* for the right hand. It will then be found that the left hand has instinctively found its low octave *D*. How? It is hard to analyze the process exactly. The space-measurement sense seems to direct it to approximately the right place, and perhaps the fourth finger guides the others to their exact spots by feeling the *E* flat.

The left hand will find much difficulty at first in striking its *G* and *B* flat in the treble. A few trials, however, will show how it can guide itself, first by resting lightly on the right, which will thus serve as a fixed landmark, second by feeling the pocket just to the left of the three-black-key group.

The next difficulty will be the jump in the left hand from low octave *A* up to octave *C*, which will seem very risky at first. The hand must be carried up to about the right place by

arm-measurement, then the little finger will be guided into the exact spot by feeling the projecting black key, *C* sharp. In all similar cases it will be found that the space-sense of the arm and the touch-sense of the fingers thus coöperate.

Look, for instance, at the thirteenth measure. The right hand, after the chord with the hold, has to rise an octave and a half, and take the high *A*'s of the new melody. The arm-space-sense working alone could, perhaps, hardly find this new position with the requisite certainty. But the fingers are all alert, and the middle finger has but to find the pocket between *D* sharp and *F* sharp to start the hand off with perfect confidence. The quick octave-jumps in the left hand, in this same measure, are far more troublesome. Here the arm-space-sense has to work practically unaided. A tendency will probably be noticed at first to jump too far, but practice will correct this.

Thus the student will find at every turn, in whatever piece he may be playing, opportunities to test and develop his power to feel his way about the keyboard.

Concentration-Exercises on the Soundless Clavier

It will have become increasingly evident from all that has been said, that for the full use of the tactile sense in piano-playing a rare degree of mental concentration is necessary. One cannot pursue such studies as have been here suggested with a listless, wandering, or preoccupied mind. Indeed, in this very fact lies one of the prime virtues of such a method of practice. Too many of the ordinary exercises in daily use by thousands of piano-students permit or even encourage by their deadly monotony a half comatose mental condition, and depend entirely for their effect on the mere mechanical repetition of certain bodily movements. All genuine physical dexterity, however, depends on mental coördination; and it is, therefore, a pitiful waste of time and

energy to try to acquire by routine repetition what could be acquired so much more quickly and so much better by intelligent effort guided by rightly directed attention. Not the least valuable feature, then, of piano study governed by the thought of developing the tactile sense will be the alertness of mind it requires by its procedure and encourages by its interest.

The concentration of attention on tactile sensations which is attained by the use of the screen, cutting off as it does the visual sensations, which might prove distracting, may for short periods of practice be still further enhanced by cutting off also the audible impressions, that is, the sounds. This is accomplished by using a practice clavier, or "dumb piano," in place of the ordinary instrument. Provided with the screen, it affords us a means of training the sense of touch, absolutely undistracted and unaided by any other impressions, either of sound or of sight. It is piano-playing

by the touch-sense reduced, so to speak, to its lowest terms, or in its most stringent form. The player now has to depend on the touch, not only to guide him to the key he is to strike, but to pronounce as to its correctness after he has struck it; the touch-sense is both performer and, in the absence of the ear, critic. Great delicacy and certainty are therefore needed, and the beginner will find himself often mistaking a three-key group for a two-key group, and thus confusing, for instance, *C* and *F*, or *B* flat and *E* flat; but with persistence he will gradually gain skill and confidence. Practice on the soundless keyboard should never entirely replace that with the ordinary instrument. It would make too severe demands on the attention, and it might injure the tone-quality of the playing. But it is a form of intensive cultivation of the tactile sense which, used in moderation, has a quite unique value for the ambitious student. At present the

soundless clavier is obtainable only as an instrument separate from the piano. If the value of this method of practice becomes widely recognized, however, it is to be hoped that piano-manufacturers may introduce some device by which the connection between the keys and hammers may be cut off at will. The ordinary piano will then become available for this kind of practice.

In order to treat fully the importance of mental concentration to the student, and the best methods of cultivating it, a separate article would be necessary. For the present it must suffice to point out that the elimination of impressions of both sound and sight secures necessarily a remarkable degree of concentration upon touch sensations.

Secondary Advantages of Tactile Guidance

So far we have been insisting chiefly on the desirability of the systematic use of the touch-sense on account of the certainty and reliability it gives to the playing. No one who has had any experience of playing in public will be likely to underrate its value on this score alone. How distressing it is to practice conscientiously for weeks, get a piece going faultlessly, and then at the performance to which all this preparation has led up, distracted by strange lights and faces, play it worse than you did at the beginning! Yet this is what is always likely to befall any one who depends on his conscious will and on his fallible and easily deceived eyes for guidance, who does not train his touch to guide him with the certainty of instinct through the labyrinths. If only for

accuracy of performance, it is well worth every pianist's while to develop his tactile sense to the utmost.

But there are several secondary advantages which he will be pleased to find attending on the development of this so often neglected sense. These may be suggested in closing.

The first is *relaxation*. We hear much of the value of relaxation to the pianist, and sometimes we see pathetic efforts made, with clenched fists and gritted teeth, to attain it. But the best way to get it is to forget about ourselves and our hands, wrists, fingers, muscles, and nerves, and to cultivate a mood of curiosity about what comes into the mind from outside, a recipient, a passive mood. This is precisely what happens when we think about our tactile sensations, about what the keys do to us rather than what we do to them. The exploring hand is necessarily limp. To tighten up the muscles is to cut off the sensations. The

habit of tactile observation, in short, is the habit of relaxation.

A second advantage is *good tone*. In recent years it has become more and more widely preached and recognized that pressure-touch (weight-touch) produces a mellow, agreeable tone, while striking produces a jangle of high, dissonant partial tones. Now, the way to produce the pressure-touch is to keep the fingers close to the keys; and the way to form the habit of keeping the fingers in contact with the keys is to practice with the attention directed to the tactile sensations. The kind of practice here recommended, therefore, is fundamentally suited to call into play the pressure-touch which produces good tone.

Finally, *speed in execution* is well known to bear a direct relation to economy of movement. Every waste motion of hand or arm means delay; in the *glissando* the finger never leaves the keys at all, and the *glissando* is in

this respect the archetype toward which all rapid fingered scales aspire. But what other mode of practice could so constantly foster the habit of preserving contact with the keys, and thus of dispensing with useless movement, as this which is based on the idea of feeling of the keys? Thus speed will be another of its by-products.

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In conclusion, those readers who still remain skeptical may be assured that this method of practice is not advanced as a cure-all, a universal nostrum which will turn the strummer into the artist. All that is claimed for the tactile sense is, that it is obviously depended on very largely by the great concert pianists, that psychology shows why it should be in many ways a more reliable guide to pianists than the eyes, and that a personal trial will in a few weeks enable any one to do, with its help, things that he could never do without it.

Whoever perseveres in such a test until he has got past the paralysis that attends the first use of a neglected sense will, it is believed, continue thereafter with enthusiasm on his own account.