Lots of good may be accomplished by encouraging both types of vibrato. In any case, no harm can be done as long as the student is encouraged to keep and improve his natural vibrato.

I would like to make this personal request to viola teachers: If you continue to teach a student beyond the beginning years, modify some of the things that you taught him initially. Explain to him why you taught him certain things at first and why you are now suggesting some refinements and exceptions. Tell him why you had to teach him that water seeks its own level, and show him why you now have to teach him about capillary attraction.

Janos Starker

An Organized Method of String Playing

Since 1955 I have been giving string seminars regularly on four continents under the title "An Organized Method of String Playing." The following is an attempt to describe what takes place in these public classes.

Introduction

"An Organized Method of String Playing" (OMSP) is a way of thinking about music and instrumental playing. Its objectives answer professional needs: stability, power, health, maximum use of limited time, increase of confidence and avoidance of stagnation, deterioration, nervousness, and insecurity. Though these needs are based on varying degrees of talent and ability, physical and/or musical, they are aggravated by previous learning processes. The necessary imitative learning of a child is too often continued into adulthood. Changes from concerned to unconcerned teachers, or vice versa, result mostly in the unexplained use of various schools of learning. These schools, often marvelously demonstrated by highly gifted exponents, reflect solutions of the exponents' individual shortcomings or advantages. In order to explain the thinking process behind the approach to OMSP, let me give some background as to its origin.

As a child prodigy from the age of six, I was fortunate in having a great teacher, Adolf Schiffer, a student and successor of David Popper. His forte was in assisting his students develop their natural abilities. He was a superb cellist and musician, but because of a rather late start as an instrumentalist, he limited his performing activities to string quartet playing. He used no method. He assigned
material, corrected musical errors, played fragments to clarify his suggestions, and ridiculed unnatural motions that were contrary to the music. Theatricality was discouraged and dismissed as fitting only for clowns to employ in lieu of talent. Inborn or inbred eccentricities when coupled with talent were considered sufficient to reach recognized stage heights.

Two other exceptional teachers to whose wisdoms I had access were Leo Weiner (piano chamber music) and Imre Waldbauer (string quartets). Weiner, a composer and a mediocre but functional pianist with a powerful musical mind and incredibly disciplined ears, taught his disciples to hear. Waldbauer, a highly respected violinist of his renowned string quartet, had a scientific mind and was preoccupied with the various mechanical ways of producing sounds. He clarified the need for and the possibility of verbal definitions based on experience and on the works of Hugo Riemann and Friedrich Adolph Steinhausen.

After I had reached instrumental maturity and control of a large part of the repertory, World War II caused a year of absence from my instrument. Following this silence I had but two weeks to prepare for my first public appearance. I continued the profession successfully, and shortly thereafter I occupied the solo cellist's post of the Opera and Philharmonic Orchestra of Budapest. A year or so later I found myself listening to a recital in Vienna. One of the most admired instrumentalists of our time was performing, a legendary former child prodigy. His left hand was vibrating indiscriminately and barely managed to arrive at the necessary destinations. A loud irregular breathing penetrated the entire hall. I left in the intermission on the verge of nausea. We are all aware of the pressures of international concertizing and reluctantly accept the fact of human frailty, justifying an occasional "off night." A series of sleepless nights forced me the realization that the occurrences at that concert involved issues far beyond an "off night." I had nightmarish visions of the legendary peasant eye surgeon who, when told of the dangers involved in his activities, was never able to repeat his feats. The historically low percentage of child prodigies who grow up to be mature artists needed explanation, and it became imperative to have an acceptable reasoning as to what governs the satisfactory mental and physical functions of a performing artist when called on stage.

Through some horror-laden months of ineffective public experimentation, followed by a long stretch of self-imposed inactivity, I became aware that only through conscious understanding of the elements that allow music to be produced on an instrument can one become a professional and reasonably independent of the constant hazards. Only through conscious understanding can one control the "skill" part of producing art and distinguish the gifted dilettante from the master professional. This realization induced me to search for the "basic" problems involved in playing an instrument; basic problems that are identical for all and inherent in all music irrespective of subjective feelings and judgments. Invariably, when the search reached the point where the problem was defined, solutions presented themselves, explaining and justifying the differing approaches. Invariably, advantages and disadvantages appeared that were humbling to those whose religious fervor for a chosen route deterred all contradictions, while for those with vastly different abilities answers were provided.

The emphases on professionalism are manifold. Regardless of whether a musician performs as a soloist or as a member of a small or a large ensemble, or assists a budding instrumentalist in learning the "trade," the significance of understanding and knowledge of the issues involved is far beyond the value of natural gifts. It would be infantile to discount the lack of democracy in the distribution of talents; however, the goal toward maximum utilization of one's gifts is universal. When talent and fortunate circumstances coincide, there may be no need for theories in order to arrive at great results. Those who are satisfied with their output would never bother about problems, since they do not have them. On the other hand, only those are safe from fear who do not realize the risks involved; risks, not necessarily personal, but artistic. It is one thing to lose a competition or audition because of an inferior showing, and another not to win over someone equally good or better. The risks are that of self-respect, and above all the respect for music itself. One ought to be nervous before a performance to some degree, not because of fear of the unknown but because of one's respect for the significance of artistic contribution.
After years of investigation I was able to place the various problems in some obvious categories. This categorizing alleviated the universal plague of lack of practice time. I would venture to say that there is no musician who has not said on occasion, "If I'd had more time I could have..." We may deplore the lack of time for all human endeavors that aim toward unattainable goals, but the misuse of time is just as tragic. It is quite usual for a player who practices one hour to spend half that period repeating already well controlled passages and melody lines. Commonplace is the player who endlessly repeats a difficult passage without realizing that the problem is not a left-hand one, but lies in the bowing, string-changing, phrasing, grouping, or holding of the instrument, and so ad infinitum.

The four categories are: I. Playing Preparation, II. Right Arm-Hand-Fingers, III. Left Arm-Hand-Fingers, IV. Musical Application. The order and titles are clearly arbitrary. The fourth group, musical application, could obviously be first, or should it be? It ought to be taken for granted that all aspects of instrumental playing must be motivated by musical intentions. To play in tune, to produce uninterrupted lines, to eliminate scratchy sounds, to guard against uncontrolled dynamic changes due to changes in bow speed, and to avoid unwritten notes while connecting distant intervals are not technical demands but musical ones. The solutions are technical nevertheless. So in order to fulfill the inner musical needs, physical conditions must be as close as possible to the ideal so as to allow the musical ideal to emerge.

A passage that contains even units should be played evenly. The execution requires technical answers; the motivation remains musical. The element of freedom, the beauty of individual interpretation of black and white notes is taken for granted. However, freedom of interpretation does not justify anarchy due to technical shortcomings. *Rubato* is freedom within the phrase; *agogic* is freedom within the bar. The meaning is clear. Notes lengthened or shortened because of melodic, harmonic, rhythmic, and emotional significance must be balanced so as to preserve the structural unity of phrases and movements. Myriads of individual varieties are within the realm of possibility without destroying the essential balance. Such an approach requires discipline, primarily oral, but in order for the oral senses to function, one needs physical and mental discipline. Well known is the player who hears what he imagines in his inner ear instead of what emanates from his instrument. Well known is the player who thinks that everybody else is too slow, while he races indiscriminately through his passages. Well known is the stage in learning a work when one can only play the difficult passages fast, as the digital learning precedes the musical learning. In other words, discipline must be the basis of one of the classic disciplines, music, and once attained, freedom of expression may spring forth.

The order of learning is significant. Beautiful artistic ideas running rampant without disciplined instrumental control remind one of a ride in a magnificent automobile over unpaved roads. Writing poetry in a language yet unlearned seldom succeeds. One must be acquainted with vowels and consonants, so as to form syllables, words, and sentences. Then poetry may eventually emerge. The cold-bloodedness vaguely implied in this approach is a matter to be considered, but only in the light of professionalism versus dilettantism, and some further reference will be made to this when the fourth group is discussed.

Artistic motivation should be understood as the drive toward purity, simplicity, and structure in re-creating masterpieces. Underlying these motivations is what one may call the basic or ideal legato: undisturbed musical sounds that linearly ascend or descend; harmonic successions that continue toward focal points, climactic or anticlimactic; rhythmic consistencies—pulses that are not interfered with by changing rhythms; dynamic contrasts based on musical content and not on impressive volume effects; and, finally, recognition of the inherent voice examples that are the basis of all musical aspirations.

With these thoughts in mind it may be evident that the attempt to describe OMS is doomed to partial success at best. Instrumental playing is based on multiple sensations. One may hint at them and induce them on occasion, but ultimately each individual must arrive at these sensations on his own. That is why the maximum results obtained by this thinking process are accomplished in seminars
where the participating groups experiment, observe, and, on occasion, discover that some of these “sensations” are either novelties or elements that are known but ignored. None of the problems discussed are original in either their statement or their solution. They are based on previously known principles. The order in which they are proposed is intended to show the interrelations leading to desired musical results.

Category I: Playing Preparation

The problems in the first category involve the use of the muscles and the application of power and weight, as well as motions, balance, breathing, and timing; the last with special consideration of conscious anticipation and delay of all actions.

I have always been preoccupied with the idea that the energy spent to supply the physical needs of playing an instrument should be minimal and thereby allow the mental and emotional faculties to function freely for the sake of communicating the musical message. The visible struggle of a performer may create sympathy, but it has little if anything to do with music. In the field of stagecraft this sympathy can serve us well when the musical message lacks conviction. The adrenaline expended by a perspiring, contorting performer often substitutes for artistic substance. In order to use only the minimum energy required, one must have maximum power available at all times and use only what is necessary.

The power is aimed at the contact points on the strings, via the bow and the left fingers. The power of the arm originates in the back muscles. The goal, therefore, is not to hinder the flow of energy from the source. It seems obvious that if the fingers, hands, forearms, upper arms, and shoulders function without the support of the back muscles, the locally used energy will have to increase proportionately.

“Relaxed” playing is in reality the even distribution of muscle tension. Though we are playing an instrument while “making” music, the playing requires power and precludes relaxation. To attain this even distribution of muscle tension we should try to locate the hindrances. Wherever joints meet there is a tendency to disrupt the flow of tension by unequal tensing of the next set of muscles, and forming what we may call angles. The most frequent trouble spots are the shoulder, the forearm (when opening), the thumb, and the muscles beneath the knuckles. We should attempt to avoid angular formations and to create the feeling of curves. At the same time, whenever possible, descending lines should be formed by both arms, as a further means of avoiding the disruption of continuous energy flow. Of course it is impossible for the left arm to create descending lines when playing the violin, the viola, or the first few positions on the cello.

Two simple exercises will help one to recognize the different sensations of this angular versus curved feeling. (1) Raise both shoulders very high, pull the arms back, rotate the arms inward, bring them forward at skull level while bringing the backs of the hands together, then drop both arms to their respective instrumental playing positions, so as to promote the active participation of the back muscles. (2) Tense the upper arm muscles as much as possible but avoid any tension in the hand and fingers. This maximum tension should result in a shaking forearm. Then make a fist. Gradually squeeze the fingers in the fist and slowly open the forearm to allow the upper arm tension to travel into the fist. The natural tendency to tighten the upper arm excessively to produce stronger dynamics and also the crucially wrong tendency of automatically tightening the forearm muscles when accelerating should, by this exercise, be reduced and make one aware of these misuses of tension.

The application of weight can be approached through the suspension of the arms. Again, when lifting the arms, the back muscles, not those of the upper arm, are required for the necessary power. Prior to lifting, total relaxation is experimented with, with the limbs and body devoid of any tension, and only the legs holding the body while standing. The difference in the sensations of weight and pressure in preparation for the eventual needed mixture is advanced in this way.

The ability to apply power to the changing needs of playing high strings, low strings, high positions, and low positions requires the ability to shift the body weight without losing control, ipso facto, balance. The following simple exercise will aid in achieving controlled body balance: Stand, place the weight of the body on the right side, lift the left leg, bend the right knee. Repeat a few times until reasonably comfortable. Repeat the same exercise on the left side using the right leg. Then, while seated on the edge of a chair,
place the right foot in the center, lift the left leg, and rise on the right foot. Repeat with the left foot. The difficulties encountered will make one aware of the lack of body control, ill-directed body weight, and the need to feel the changing balance requirements.

Breathing, that is, the use of controlled breathing, can be approached by various means. The general tendency to use excessive speed at the start of all actions is demonstrated by the quick intake of air when inhaling and, similarly, when exhaling. The following exercises divide the amount of air into even groups of 4, 6, 8, 12, 16, 24, etc. Starting with empty lungs, sip air audibly and check the speed of the air intake, with the predetermined group in mind, so as to finish with the lungs completely filled. Do the same while exhaling. Later, when experimenting with control of bow speed, practice synchronizing the division and speed of the bow with exhaling and inhaling.

Lack of controlled breathing results in other noticeable disturbances: Holding the breath while playing difficult passages causes incorrect accents, unplanned groupings of passages, and, most important of all, unprepared starts of phrases and changes. Anticipation of all actions is of the utmost significance in all phases of instrumental playing and music making. The word anticipation is used in the sense of preparation, in contrast to delay. The following sentence seems to define the need: Anticipation is part of music itself; therefore it must bear all the characteristics of the music that follows—time, dynamics, melody, and harmony. The start of a phrase requires an anticipatory, preparatory upbeat or cue. This cue must reflect the basic unit of the phrase. A change of character requires a preparatory cue with the change inherent in it. A bow change requires the preparation of directional change. String changes require preparation of the new bow level. Position changes require preparation of the new arm position. Speed changes require preparation of the necessary tension adjustments. If the breathing is not hindered these anticipations can be consciously assisted by the proper intake of air. Naturally, through some training, most of these actions become subconscious, and only in extreme difficulties and in the practicing process, does one need the conscious application.

Anticipation is clearly responsible for uninterrupted, continuous, fluent actions, and in a musical sense I like to refer to its result as legato, in contrast to the marcato character resulting from delayed actions.

By now it should be evident that the language employed to describe OMSP deliberately avoids the use of scientific terms. It is the language applied in the classroom during seminars, where the visual and audible aspects are stressed in the form of examples of right and wrong, pleasant and unpleasant, convincing and unconvincing, struggling and effortless, and so on.

In group discussions many of the issues intertwine, as in actual application. For instance, how one holds the instrument belongs to the first category, playing preparation. Nevertheless, it is usually discussed either when the basic legato is explored, or when the guiding principles of the use of the left hand are negotiated. The reason for this is (1) to accommodate the changing requirements of the bow on different strings, and (2) to provide a basis for the left hand so that the fingers can stop the string at an identical angle in all positions.

In the seminars the following elements are experimented with in an effort to find suitable positions for the differing needs of each individual: One must first, as in the balance experiment, secure the ability, seated or standing, to shift the weight of the body left or right at will; second, secure the unhindered function of the arms; and third, confront the issue for cellists of the length of the end pin. This last item evokes intense debates in most seminars. The oversimplified answer as to whether to use the straight, the bent (Tortelier), or the excessively long end pin is that the height and the arm length of the player should be the deciding factors. Holding the instrument more vertically allows the average-sized person to concentrate the power on the contact point on the instrument. It has the disadvantage that the bow tends to slip downward; on the other hand, it makes easier all light, fast bowings and the synchronization of the so-called virtuoso elements. Holding the instrument more horizontally is an advantage for tall players with long arms, as they can use the forearm more comfortably because of the increased distance. The discomfort of holding the arms higher is compensated for by the ready effect of gravity, generally resulting in louder sound production. The ability to see the strings is of no consequence, unless it is a psychological advantage.
Therefore, the summation is that whichever end pin is used, it should not hinder the free motion of the arms. All positions should be within reach without the need to alter the body position. The instrument should not interfere with free breathing. The cello should be positioned in such a way that the knees can move it left and right without the upper half of the body moving. The knees should not cover the ribs of the instrument, thus muting the sound. At the same time the knees should be able to apply counterpressure, resistance against the bow, at will.

It is advisable to experiment with various heights of the chair (if it is not adjustable, a pillow or book can serve), until conscious body control is attained. It is of value to experiment with various leg placements and the proper part of the chair to occupy. With a standard end pin the experiments favor the front of the chair. The legs can be positioned either left foot forward on the heel, right foot quite far back on the toes, or the reverse. Both feet planted solidly better serve the users of the curved or long end pins.

**Category II: Right Arm-Hand-Fingers**

The second and fourth fingers of the right hand obtain the basic balance; the others transmit power. With the arm suspended, rest the bow flat on the second finger with the little finger counterbalancing on the top of the bow. After a somewhat secure feeling has been obtained, place the first and third fingers, then the thumb, and then grip solidly. Now switch the little finger to the outside into its regular position, without allowing the bow to tilt. A whipping hand motion will test whether the hold is secure enough to prevent the bow from slipping. The power of the arm is transmitted through the thumb and third finger for the down-bow, and through the thumb and first finger for the up-bow. Starting from the middle of the bow, the rotation of the forearm prepares for the next bow direction. Down-bow: pull the entire arm, gradually lift the upper arm, approximately at the middle start opening the forearm and continue to raise the upper arm until the tip of the bow is reached. Through the forearm rotation we arrive at the required position for the up-bow. Up-bow: start with a pushing action, close the forearm in, gradually lower the upper arm, and from approximately the middle of the bow, return the entire arm to its original position. We say "approximately" because of the variations required by the different strings. This entire arm–forearm action defines the basic legato stroke.

The circular function of the arm, as with all limbs, would result in a circular motion on the strings, unless the forearm takes over the horizontal line. At the frog the weight of the arm through the bow, combined with the speed of the motion, provides the required friction to set the string in vibration and establish sound. As the arm increases its distance from the string, pressure substitutes for the diminishing weight. The pressure travels through the third finger and thumb, and, as the described arm function continues, in the up-bow the first finger takes over the role of the third finger. The muscles leading to the third finger and thumb are responsible for the power while pulling. The muscles leading to the first finger and thumb are responsible for the power while pushing (supination–pronation). The bow should be at a 90° angle on the second string. On the cello the angle of the bow should increase for the lower strings and decrease for the A-string. On the violin and viola the reverse is true. This basic legato stroke, with the forearm opening and closing without a noticeable change in speed, should provide us with the basis for almost all existing strokes.

I feel the need to remind the reader that this description of the legato action is full of omissions and contradictions. However, the purpose of this summary is not to disprove or replace any of the far more scientifically correct writings on the subject. It is rather to acquaint one with how, in seminars, problems are solved through experiments, and how hoped-for results are obtained.

As the basic legato stroke is practiced slowly, attention should be focused on the position of the arm at all points between the frog and the point. Whatever stroke we use, and whatever part of the bow we use, the arm should be in the position as established in the basic legato stroke. If we play a series of staccato notes up-bow, when we arrive at the middle the entire arm should gradually return to its original position, while continuing the staccato to the frog. If we start a note in the second half of the bow, the forearm should be in "opened" position, and the upper arm accordingly at a higher level. Higher than what? Higher than while playing in the first half of the bow. All strokes that require the bow to leave the string must still
follow the same rule. While the bow is in the air the arm motion remains the same as if it were on the string. No change in speed should occur in the air unless the musical notation requires one, and, as such, demands preparation.

Bow changes, as well, must take place in the air if the preceding note has part of its value off the string. The spiccato stroke should be looked upon as a series of fast bow changes. In all bow changes the pressure of the thumb should be reduced immediately prior to the change. In the standard legato stroke the pressure applied through the thumb creates the unity of the forearm and the hand. Any sustained sound requires this unity, and in this sense I prefer to refer to it as sostenuto bowing. When the thumb pressure is reduced, and the forearm tension is reduced accordingly, the hand starts moving independently. As the forearm leads the repeated short notes up and down, with the hands in circular motion (almost no tension in the thumb), it will allow the bow to leave the string and thus spiccato will result. The experimentation is as follows: First, suspend the arm with no tension in any part of the arm or hand. Second, move the forearm horizontally left and right, and let the hand move as a consequence, hanging freely. Third, move the forearm up and down and allow the hand to move accordingly. Fourth, move the forearm clockwise and counterclockwise, allowing the hand to make similar circles. Always remember that it is not the hand that initiates the movements but the arm. Fifth, press the thumb to the index finger very strongly and try the horizontal movement again. As the hand does not move now, continue the arm movement, and gradually reduce the thumb pressure to the point where the hand starts moving again independently. Finally, with bow in hand on the string, try step five, starting at the balance point of the bow.

The placement of the thumb is approached with the idea that it should not be placed. When the hand hangs the thumb is in line with the first finger. When the forearm turns inward the thumb is in line with the second finger. The significant factor is that when the thumb is "pulled" toward the palm to be in line with the second finger immediate muscle tension results, and that should be avoided. The same is true for the left thumb placement.

In order to preserve the uninterrupted descending line of the arm it is necessary to clarify the role of the elbow and the wrist. Since both are joints, it is preferable to say "raise or lower the upper arm" instead of "raise or lower the elbow." Similarly, "raise or lower the hand," instead of "raise or lower the wrist." The multitude of bowings are discussed in terms of hard and soft consonant attacks, the length of the vowel content on the string, time spent on the string or in the air, stops with consonants or vowels, and notes ending with final consonants as in vocal use —m or n— so as to avoid dead sound stops.

The self-imposed limitations in the seminars prevent a detailed explanation and clinical description of the known bowings. The emphasis is on recognition, samples, and modes of experimentation. The most common problem, which is quickly recognized, is the lack of sufficient contact with the string toward the tip of the bow. One approach to curing this ailment is to have another person hold the tip of the bow while the player attempts to play an up-bow and a down-bow. If the hold is firm the player must exert considerably more power than usual. Then, in the form of isometric exercises, the player is asked to do the same, imagining that someone is holding the tip of the bow. When the contact is not sufficient, excess bow speed will create whistles instead of sounds; conversely, when too much pressure is applied without commensurate speed scratching will result.

**Category III: Left Arm—Hand—Fingers**

When the discussions of the OMSP reach this group a great number of issues are supposed to become self-explanatory. The principles governing the use of the arm, the shoulder, and forearm opening have been discussed in the first and second groups: to distribute muscle tension evenly, to keep from breaking the muscle line, to open the forearm continuously, to avoid all abrupt motions due to sudden changes in speed, to recognize the primary importance of avoiding angular tensing of the thumb in all positions, and to reduce forearm tension when playing fast passages. After all these questions have been defined and recognized, the placement of the fingers and the three different positions on the cello (versus practically only one on the violin and the viola) have to be explored.

Basically there are three different approaches in placing the
fingers on a string: slanted backward; slanted forward, thus having a small finger contact point; and perpendicular, with maximum surface flesh contact. Each of these approaches has advantages and disadvantages, and affects the use and choice of vibrato, the various connections, slides, and the ability to explore all types of musical and virtuoso elements. The obvious suggestion is to master all three ways and apply them according to need.

The perpendicular hold serves well on thicker strings and in the first seven positions (positions counted by half-steps). The large surface contact on the strings gives a feeling of security, and the arm weight is used to more advantage, but when proceeding to higher positions, breaks in the motion and alterations in the sound quality occur. The intonation is considerably less exact than when the contact point is small, but that becomes an issue only on a very high level of music making, where clear overtone responses are aimed for.

The backward slant answers the shortcomings of the perpendicular hold; continuity all through the fingerboard is facilitated, and intonation is far more exact. The backward slant favors the use of the first and second fingers and their extensions. The forward slant favors the use of the third and fourth fingers and their extensions. The disadvantages occur in the lower positions, where the weight and pressure concentrate on a minute part of the fingertip and thus extreme exactness is required. With the perpendicular hold one is more likely to use hand vibrato, moving above and below the center and using the thumb, pressing on the neck, as an axis around which the hand rotates forward and backward. The slanted hold is more suited to arm vibrato, with the thumb only slightly touching the neck and moving with the hand and forearm in an identical direction. The hand-forearm unit is similar to that of the sostenuto sensation of the right arm.

Because of the greater tension used with arm vibrato, the application of indiscriminate vibrato to cover up intonation discrepancies is less likely. The vibrato, an element of decoration, should be applied to enhance the emotional content and to help the notes that are not enriched by natural overtones. Notes such as F, B, A flat, and E flat do not have corresponding overtones on a four-stringed instrument, while the notes that parallel the open strings and their harmonics have responding overtones. The vibrato should also be used to correct this tonal discrepancy. I rarely go beyond the rudimentary description of the various elements required in the use of vibrato. In group discussions and experimentations an attempt is made to discover what prevents the individual from functioning at will with a continuous motion. Once the problem is pinpointed, ways to improve are suggested.

In up-and-down glissandi, stop with finger pressure and try to continue the arm motion, as in back-and-forth glissandi. Place a finger on the back of the stretched-out right hand and try to obtain a feeling of continuous motion without the string-stopping pressure. Exchange fingers on the same note and try to maintain a uniform quality in the successive sounds through continuous motion.

Researchers, using complex machinery, have not yet come up with an agreed-upon analysis of the acoustical properties of vibrato. Therefore, we have to rely on our own audio mechanism, which is developed through individual experiences. At whatever stage that development takes us, we should try to satisfy the inner need, and then strive to expand it. This principle involves all aspects of playing music, and when our concern is the left hand, the inquiry turns to the geography of the fingerboard.

It is generally recognized that the basic, unalterable problem of intonation on a stringed instrument is the diminishing size of the intervals as the pitch rises. Since the frets of yesteryear are preserved only on the guitar, we should aim at developing a mental and physical keyboard on the fingerboard.

The first step is to accept the classification of standard and extended positions. The extended positions require unnatural hand positioning and are therefore dealt with as a deviation from the norm. In my belief they should be used only when they are unavoidable for technical or expressive reasons. On the first half of the cello, when the thumb is not used as a playing finger, we distinguish four-finger positions and three-finger positions. The placement of the first finger defines the position, and therefore it is preferable to name the positions according to the note played by the first finger, instead of the numbering based on the diatonic scale. This helps in visualizing the fingerboard as well as in memorizing. If the chromatic scale is used then we have eight four-finger positions, where the fingers are
each placed a half-step apart and enclose a minor third. From the
ninth half-step on, the fourth finger is seldom used, though it can be.
This area causes immense problems for cellists because of the tran-
sition of the thumb into thumb positions. Instead of leaving the
thumb in a sort of limbo, if we develop four distinct three-finger
positions, the thumb will adjust to a different placement on the side
of the neck, as in fluent preparation for the thumb position. The
development of the three-finger position (there are four of them,
because if the highest note played is a minor third above the octave,
there is no real need for a standard-sized hand to use the thumb on
the string) should immediately include the extensions for practical-
ity. The second finger is now a whole-step away from the first finger
rather than a half-step, and the enclosed interval remains a minor
third, as in the four-finger positions.

The thumb positions are identical with the standard positions on
the violin. The interval enclosed between the thumb and third finger
is a fourth. The name of the position is defined by the note played by
the thumb, and the distance between the first and second fingers can
change from a half-step to a whole-step. Thus many permutations
are possible, and a number of exercises have been devised, based on
this system. The exercises, no different from many in traditional
exercise books except in their mathematical formulae, are contained
in my book, An Organized Method of String Playing—Cello Left
Hand Exercises. The book contains sample exercises to develop
the basic four-finger, three-finger, and thumb positions. For various
reasons double-stops are used for this development. First, the
greater number of fingers that sense a position the greater the securi-
ty. Second, when playing double-stops, which constitute the major
part of a triad, one is more likely to be disturbed by discrepancies in
intonation that call for correction. Third, the sense of a note that
belongs to changing harmonies readies the player to observe this
essential element. When positions are approached with double-
stops, the enclosed intervals are considered on two strings. There-
fore, in the four- and three-finger positions we speak of a seventh or
a major third, and in the thumb positions, octaves or seconds (4–1,
1–4, 3–1, 1–3, Q–3, 3–Q).

of delayed slides. The time is taken from the second note. The finger to play the next note slides. The slide starts on the next beat. If a bow change is needed, as in most cases, the slide is contained in the next bow.

Combination slides are required when higher fingers change to lower fingers (3 to 1, 4 to 3, 3 to 2, etc.) as anticipated slides. The higher finger still leads the slide, but as close to arrival as possible the next finger pushes out the previous one. On very distant connections the start may be anticipated and the arrival delayed. The decision of which type of slide to use should be based on musical taste. The same goes for how much of the slide should be audible, or even featured. The highly Italianate, crescendoed, backward slides are disturbing to many of us, and seem to be a throw-back to the nineteenth century. Russian musicians are fond of featured crescendoed slides, though most of Western literature seems to negate their use. Reduced pressure of the bow while traveling will cover the slide. Constant or increased pressure will display or feature the slide. A variety of expressions can be attained simply by reapplying pressure before arrival at different points.

To further left-hand security, the hand placement should aim the fingers over two strings, or rather toward the fingerboard under two strings. The feeling of walking a tightrope, when all the fingers hover over one string, is thereby reduced. (This is one more reason for practicing double-stops.) This two-string feeling in thumb positions brings up a problem that is approached differently by the various schools. The usual fifth hold of the thumb on two strings, providing a constant position basis while the other fingers manipulate on the neighboring string, tends to obliterate overtones on the lower string. The thumb hanging in the air, or worse, tensing in the air, vastly reduces security and induces greatly differing vibrato with the changing fingers, but allows for richer overtone response and louder sounds.

For a decade or so a quiet revolution has been in the making to treat this issue, notwithstanding the traditional approaches in playing high positions. It proposes placing the thumb under the fingerboard and moving it there while playing the second half of the fingerboard, thereby continuing the four-finger positions, and, as if playing the violin, gradually including the distance of a fourth between the first and fourth fingers. This approach seems to answer the question of security, the matter of the functioning overtones, and the need for an identical angle between the fingers and the strings in all positions. The disadvantages are caused by the characteristics of the traditional equipment of the cello—the thinness of the fingerboard and the sharp angularity of the block, which hinder the transition of the thumb from under the neck to under the fingerboard. It is my belief that changes will occur to rectify these obstacles and open up new vistas for technical progress on the cello.

Other elements concerning finger actions are: The intensity required to press down the strings should be directed into two fingers, the thumb and the playing finger. This creates a feeling of unity between the two. (A reminder—thumb tension should not be directed toward the neck.) The feeling of unity must constantly change to the finger that takes over. The takeover requires a release of tension in the previous finger and the immediate anticipated increase of tension in the next one. Dramatic harm is caused by retaining tension in one finger while another is called on to serve. The transfer of tension from one finger to another differs only in timing in the various applications. In sostenuto playing the release is delayed, and the next finger anticipates the tension. Therefore, for a short stretch, the two actions frequently intertwine. In the case of the vertical left-hand attack, for stronger impulses and especially for fast passage playing, the release is quicker, allowing the next finger to rise higher. From this height, weight and gravity will provide the needed power to stop the string.

The so-called percussion left-hand pizzicato is discussed in terms of its use when absolutely needed. Connections between fingered notes and open strings require it, primarily to assist the open string to speak. To strengthen the fingers, practice plucking leftward with the fingers. On occasion, a descending run can be clarified by applying this action, but one should not lose sight of the fact that the necessary excess tension will, in the long run, hinder the continuity of motion. The following exercise will focus on the changing tension requirements in the forearm when playing fast runs intermittently with held vibrated notes: a note is vibrated with the first finger, exaggerated tension is applied, then tension is released completely, a fast run of fingers 2–3–4–3–2–1 follows, and renewed vibrato and
tension close. The next run is 1-2-3-4-3-2-1, without tension, closing with a vibrated and held second finger. The next finishes on the third finger, and so on; eventually we reach several repeated runs without tension before holding a vibrated note.

Another exercise to avoid cramping of the left hand when playing forte or stronger, is practicing fortissimo harmonics. It is just as necessary to avoid the frequent lack of sufficient finger pressure when playing piano, and this should be cured by playing forte in the left hand while using flautato with the bow.

At this stage in the discussion of OMSP, the seminar's attention is turned to such topics as harmonics, extensions, and pizzicato, although it seems logical that they be included in the second group, the right hand. In regard to harmonics, suggestions resort to elements already discussed. The primary reference is to the thumb position, where the enclosed interval of a fourth provides the intonation basis of harmonics, and the rest concerns the tension relationship of the thumb and the unpressed third finger. The significance of the bow speed, contact, and an undisturbed straight line are stressed and experimented with. The undisturbed straight line is required in all phases of string playing, but it is while playing harmonics that the player is likely to realize its significance and what tonal harm the lack of it can cause.

In regard to extensions, with repeated advice to avoid them whenever possible, the suggestion is made to rotate the hand so that the thumb gets closer to the third finger. This results in the feeling that the first finger is stretching back instead of the other fingers stretching forward. The moment when the stretch is not needed the first finger should move a half-step higher to obtain the feeling of the next position.

The two types of pizzicato—horizontal and melodic, or vertical and percussive—are then discussed, starting the experimentation with the hold of the bow. When fast arco—pizzicato exchange is called for the basic bow hold should not change radically. The first finger stretches out and the hand turns downward, allowing the first finger to touch the strings when needed and return for arco. For continuous pizzicato, the bow should be turned so the bottom part of the frog (called the slide) is pressed against the palm. The third and fourth fingers hold the bow, allowing the thumb to lean against the side of the fingerboard, while the first or second finger draws across the string or strings as if bowing toward the end of the fingerboard. This type of pizzicato, resulting in a melodic, ringing sound, is called for in most cases in the literature. Rhythmic percussive sounds are plucked vertically or semivertically. In fast pizzicato the thumb may support the plucking finger. Arpeggiated pizzicato uses the thumb upward and any of the fingers downward. Again this is a rudimentary approach to a complex area in which the demands of the literature bring recognition, experimentation, and decisions based mostly on individual taste.

It should be evident that aside from an occasional reference to the other stringed instruments the OMSP deals primarily with the problems of cello playing. It would be rather pretentious to claim that violinists should adopt cello-playing principles. Rather, I maintain that coinciding principles, and there are many of them, should be observed by all. That is why the thinking process itself can be useful for all instrumentalists, and it has proven itself to be so.

**Category IV: Musical Application**

Eventually the OMSP turns its attention to the fourth group, musical application, for the sake of which all the previous subjects were explored. At an early phase of this discourse, which I am rather inclined to call a “Short Soundless Summary of the Starker String Seminars” (to practice alliteration), I indicated the implied cold-bloodedness in this approach to making music. May I suggest reading a recent bestseller with the thought-provoking title of _Zen and the Art of Motorcycle Maintenance_ by Robert M. Pirsig,² or at least the sixth chapter of that book. The author meditates:

> The romantic mode is primarily inspirational, imaginative, creative, intuitive. Feelings rather than facts predominate. . . . The classic mode, by contrast, proceeds by reason and by laws—which are themselves underlying forms of thought and behavior. . . . Although surface ugliness is often found in the classic mode of understanding it is not inherent in it. There is a classic esthetic which romantics often miss because of its subtlety. The classic style is straightforward, unadorned, unemotional, economical and carefully proportioned. Its purpose is not to inspire

emotionally, but to bring order out of chaos and make the unknown known. It is not an esthetically free and natural style. It is esthetically restrained. Everything is under control. Its value is measured in terms of the skill with which this control is maintained.

To a romantic this classic mode often appears dull, awkward and ugly, like mechanical maintenance itself. Everything is in terms of pieces and parts and components and relationships. Nothing is figured out until it’s run through the computer a dozen times. Everything’s got to be measured and proved. Oppressive. Heavy. Endlessly grey. The death force.

Within the classic mode, however, the romantic has some appearances of his own. Frivolous, irrational, erratic, untrustworthy, interested primarily in pleasure-seeking. Shallow. Of no substance.

These excerpts may explain to the reader that my attempt is to combine the romantic and the classic modes in dealing with the “skill” part of our art.

The “motorcycle,” so described, is almost impossible to understand unless you already know how one works.

This sentence may explain the omission of charts, musical examples, and pictures that would be called for in any attempt that deals with mechanical data. I am fully aware that in this chapter I have given only superficial treatment to many complex issues, but I expect the reader to be familiar with these matters and visualize, when necessary, the proposed solutions or training processes. This same expectation allows me to use only a few perfunctory references to the subjects discussed in the fourth group.

The OMSP, when presented in a seminar group, invariably combines with the standard, stereotyped master classes; master classes where the “master teacher-performer,” after having listened to the young inexperienced player, suggests alternate ways of playing a piece, and usually demonstrates his ideas as well. These ideas are the result of a lifelong stage or studio experience, of a lifelong experience of playing and listening to the literature of Bach, Mozart, Beethoven, etc., and of forming musical stylistic preferences based on total exposure to life and music. To my mind the effect of these “end results” is of limited use to a young musician, or to a musician who may or may not ever have similar exposures. What may be of use is learning the means through which his or her individual gifts and experiences will be able to surface, or communicate.

With these principles in mind the fourth group is reserved for aspects of music making such as “sense of rhythm” versus “rhythmic sense” (pulse). As an exercise, beat with alternate feet while playing. Stress the direction of the beat and make the body follow it: a downward motion for the downbeat; an upward motion for the upbeat. Attention must be paid to the significance of constantly changing units. 4/4 bars may have one, two, or four units in them. Several bars may constitute one unit. The importance of every note, short or long, must be stressed. Tempo considerations must be based on audibility and singing quality of the shortest note. Failure to observe this can result in a tempo that is too fast, or one that lacks motion and so produces dullness. Contrasting moods and contrasting dynamics are of maximum importance; so are the visual, aural, and digital memorization whether or not one is using music. The use of visual imagery in the style and mood of the music, in order to reproduce the wished-for concepts at will, is also of paramount importance.

**EPILOGUE**

Just as the length of the discussion of the musical and artistic aspects of string playing is determined by the time available in any given gathering, so must this discourse be terminated by space limitations. To anyone who wishes to find truly scientific data concerning most of the subjects mentioned above, I suggest reading Gerhard Mantel’s recent book, *Cello Technique.*

To learn musical truth one has to spend one’s life listening and playing as much as is humanly possible. Let us remember that string playing is significant, but it is only a part of music; and music is only a part of man’s attempt to satisfy his aesthetic needs after his basic need of survival has been realized. First one has to answer one’s own requirements, and then, one hopes, enrich the lives of others. I consider myself fortunate, as my needs have been answered. I hope I have assisted you in finding some answers to yours. This is the basic credo of OMSP.