CARL FLESCH

PROBLEMS OF TONE PRODUCTION IN VIOLIN PLAYING

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English Text by

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FOREWORD.

When the second book of "The Art of Violin Playing"*) was finished in 1928 I did not think that three years later I would again feel the urge to express an opinion in regard to one of the most essential parts of violinistic art, the problem of tone-production. In all my former instructive works, even if they appeared to be of the most technical nature, I had always tried to place tonal realization in the foreground. On this account I regard the present treatise, though much more modest in size, as a complement, rather than a repetition of previous statements.

In spite of the considerable outward dimensions of "The Art of Violin Playing" it was impossible for me to give an exhaustive presentation of all the individual branches which were discussed, because of the diversity of material. I had hoped that some of my colleagues gifted in the art of teaching, would feel inclined to devote themselves to this task in a series of monographs; and above all, that the application of my fundamental principles to elementary instruction would offer a grateful field to younger, capable pedagogs, who might feel the desire to take part in this work. In addition, objective treatises about individual branches, such as vibrato, trill corrections, position changes used for technical or expressive purposes, would be helpful in enriching knowledge of our endlessly varied art, and to stimulate constant and increasing investigations. Probably the reason for this passive attitude of my colleagues is to be found in the peculiar unrest and unfavorable economic conditions prevailing at the present time, which force material interests and less artistic activities into the foreground, leaving little or no time for unselfish research.

Therefore, I have decided to enter the breach and try to isolate the problem of tone-production upon the violin from other violinistic matters and to subject it to a more intense examination, than has been the case until now. Intense examination of physical-mechanical demands for correct tone-production, reactively creates refinement of the tonal sense as an integral part of musical talent, and with it, higher demands upon tonal perfection in general.

In art, as well as in life, one can only gain that for which an urgent inner necessity exists. To strengthen this desire for tonal purity, latent in us all, and to re-transfer it into reality, is the purpose of this work.

Baden-Baden, in the Fall of 1931. CARL FLESCH.

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*) Carl Flesch—"The Art of Violin Playing"—in Two Books (1923-1928). Book One, Technique in General; Applied Technique. Book Two, Artistic Realization and Instruction. Carl Fischer, Inc., New York.

PROBLEMS OF TONE-PRODUCTION IN VIOLIN PLAYING

INTRODUCTION

I have selected the particular subject of tone-production as the theme of this work for the following reasons: While the level of left-hand technic has reached a much higher point of development than in former days, particularly as to precision, intonational purity, and as influenced by more rational present day methods of study, the same cannot be claimed for tonal accomplishment, which has rather retrogressed, because of two reasons. The primary cause for this is the fact that the more searching pursuits for mastery of finger technic have automatically relegated the tonal element to second place. Again, popular music (with mainly commercial purposes) of our day, as it is usually rendered in places of amusement, instead of providing purely artistic impressions merely endeavors to create a superficially attractive effect upon the listener—an agreeable, inoffensive tickling of the ear so to say—for which a pleasing vibrato, as well as portamenti in more or less good taste will suffice. Dynamics however, in times gone by the vital nerve of tone-production, the cardinal point around which stylistic interpretation carried out in accordance with the directions of the composer had to be fashioned, have now become a non-essential in commercial music. This is because under no circumstances must the listener's attention be attracted in any disturbing manner and to no greater extent than is absolutely necessary.

It seems to me, therefore, that in our time the centre of gravity of tone-production has been transferred from the right arm to the left hand, and that the differentiating nuance (shading) has given way to a tempered, lukewarm, watery uniformity, minus all characteristic shadings. The systematic neglect of this problem, which next to intonational purity is the most important subject of our art, also carries with it the forcible fact that the laws, formerly observed for fitting tone-production in accordance with the composer's indications, are gradually falling into oblivion. In contemplating prospective artists who are endeavoring to gain admission to important musical institutes, we will find, that in respect to tonal accomplishment, two categories are represented: Players to whom tonal realization is a book with seven seals and "routiniers" who endeavor to imbue their playing with a certain degree of pleasantness by means of an equalizing, though over abundant use of the vibrato. Correct, well modified tone-production, fitted to the musical demands in accordance with acoustical laws, and which is ennobled through a suitable vibrato, never cheapened by it, is seldom heard under such conditions.

In the following chapters an attempt has been made to place the problems of tone-production in their different manifestations into the foreground. Somehow I felt at liberty to indulge in this intentional specialization, in-as-much as violin playing in all its manifold varieties has already been made the subject of my major work, in two books, "The Art of Violin Playing." The particular purpose of the references to this work is to establish connections between it and the following monograph.

I. GENERALITIES.

The legend of inborn, natural talent for tone-production has created no end of trouble since the very beginning of violin instruction. For the incapable or lazy teacher it constitutes a welcome excuse for not concerning himself with remedying tonal shortcomings and considering them a fateful, inevitable drawback. It cannot be denied that there are certain races or tribes, which under the influence of established living conditions, have developed tonal sense to a higher degree than has been the case with others. However, it does not follow by any means that an atavistically founded super-cultivation of a partial branch of the art will result in any superiority in the realm of pure music. Perfected acoustic sound merely constitutes the rough material, which first of all necessitates the enlivening spirit, to enable it to serve as bearer of the musical idea. Nevertheless it remains a noteworthy phenomenon that above all, the Polish and Russian people of Jewish extraction are particularly partial to the purely emotional elements of sound which may be explained as follows: The main occupation of the average Jew of the Ghetto for many centuries, has consisted in serving his God with lengthy prayers. Jewish prayers are mostly accompanied by a vocal litany marked by definite notational signs. In the course of time some of these developed into independent tonal creations of peculiar beauty. Small wonder then that such long continued primitive musical activity of an entire race, which felt the need of lamenting its fate in song, should have, as time went by, developed a particular feeling for that soulful beauty of tone, for which so many prominent violinists of such ancestry, have become famous. Again in France, it is the century-old authoritative Italian tradition as handed down by Viotti, which creates the impression of a tonal level higher than the average of other countries. Neither can it be denied that there is an inborn predilection for sound, developed from a foundation of natural inheritance in the *Gypsy* race. However, in all these cases there lies the danger of neglecting the specific musical content in favor of pleasing tonal effects; a rock upon which many talents trained for "pretty" tone-production only, will frequently be wrecked. Aside from these exceptions however, pedagogic experience has not been able to establish any pronounced disposition for the finer inner sense of hearing as a pre-natal peculiarity. Therefore and on this account we teachers will have to be content to teach tone-production to the greater number of our students.

Faulty sound conditions are created, first of all, through a mechanism based upon incorrect fundamental principles of tone production. It is the teacher's duty to explain clearly the apparent reasons for tonal shortcomings to the pupil and to find the remedy for their removal. On the other hand the pupil while practising should watch his tone-production continuously and search for the evident reason for any tonal shortcoming. Both, in common, should be the possessor of a highly developed tonal sensitivity, which in the form of a dominating inner impulse would *enforce* the removal of faulty sound phenomena If these suppositions proved true in all cases no occasion would have existed for me to write this book. In reality, however, the average teacher neglects the tonal element, particularly in the purely technical parts of a work, just as the pupil himself habitually overlooks tonal faults while practising. Even he who may be possessed of sufficient self-discipline and well-developed sense of hearing to correct every note out of tune will thoughtlessly pass over tonal impurity without searching for a remedy. The reason for this seeming inconsistency is that everyone knows the primary cause of a faultily stopped tone—the finger touches the string at too high or too low a point. On the other hand the tone, when accompanied by secondary noises is considered rather in the light of an accidental occurance and is usually ascribed to weather conditions, cold and heat, quality of the strings, the bow hair or the rosin. In reality tone-production is governed by equally restricted, though infinitely more complicated mechanical laws, than those of pitch, in which a mathematically established number of vibrations constitutes the only deciding fact. To express these mechanical requirements of tone-production in a clear and practical manner, without compressing them into mathematical formulae is the object of this book.

Since Steinhausen,*) a large number of more or less important treatises devoted to the physiological requirements of bowing have appeared.**) Far be it from me to belittle the value of these works which have been written to give a clearer understanding of the physiological and physical laws of bowing. While they are at times unusually informative it occurs to me that the acoustic results mentioned therein are treated in too meager a fashion. While technic of the bow and tone-production may jointly be concerned with each other, they are only partially dependent upon each other. Correct manipulation of the bow merely signifies the means through which we must try to obtain something more than a perfect, in fact an inspired tone-production, in keeping with our artistic aspirations

With this, however, it cannot be claimed that well-developed right (bow) arm mechanics will also insure corresponding tonal results. I would even assert that at times, in spite of faulty physiological principles, tonal results can be achieved which border upon perfection. One of the foremost violinists of our day, Josef Szigeti, may serve as proof of this. There is general agreement that his manipulation of the bow is based upon obsolete, faulty fundamental principles long since consigned to the rubbish heap of discarded methods. While playing at the lower half of the bow he approaches the body so closely with his upper arm that he could almost hold that celebrated book with which our teachers used to torture us. At the same time his wrist and lower arm form the notorious right angle while playing at the nut of the bow. Nevertheless his tone-production both in the cantilena, as well as in passage work is of surpassing beauty. How is this contradiction to be explained? Simply that Szigeti aided by a highly developed tonal sense, and cognizant of the secret of suitable tone-production, has in spite of his impractical bowing mechanism known how to fit one to the other. Naturally he is to be appraised in this respect only as an individualist and not as a model worthy of imitation. At any rate he provides a living example for the refutation of the exaggerated importance of the bow-arm movements claimed by Steinhausen.*)

In similar fashion it would not be difficult for an experienced theoretician to prove certain technical errors in bowing not in keeping with accepted standards in the case of almost all prominent violinists, without being able however, to establish any corresponding tonal shortcomings. In this way practice teaches us that direct tonal faults will arise only when a physiologically wrong method of guiding or holding of the bow is accompanied by a defective *point of contact* between bow and string.

In this regard the principal defects are:

1. Backward bowing (acute instead of right angle between bow and strings)—results in flat tone-production at the upper half of bow, owing to unintentional slipping off of the bow on the finger-board.

2. A too deliberate incline of the bow at edge of the hair**) causes secondary noises through touching the string with the stick of the bow.

3. Hindrances during change of bow.

4. Incorrectly gauged pressure of the bow or bow-arm.

On the other hand how frequently do we meet violinists in the concert hall whose tonal production, in spite of a "stiff" wrist with pointed elbow sharply tilted into the air or stiff finger joints, come well-nigh close to perfection! These practical experiences force us to assume that tone-production is determined to a less extent by the so-called bowing technic than by the right relation between bow and strings—the *point of contact*.

II. MECHANICAL REQUIREMENTS of TONE-PRODUCTION

Quality of sound is valued in colloquial musical speech almost exclusively from an aesthetic point of view. The terminology as used therefore principally employs ex-

*) F. A. Steinhausen, Die Physiologie der Bogenführung auf den Streichinstrumenten (The Physiology of Bowing on String Instruments), Leipsic 1907.

**) To me the most important among these seem to be: A. Jahn, Die Grundlagen der Natürlichen Bogenführung auf der Violine (Fundamentals of natural Bowing on the Violin), Leipsic 1913; K. Klingler, Über die Grundlagen des Violinspiels (On the Fundamentals of Violin Playing), Berlin 1924; W. Trendelenburg, Die natürlichen Grundlagen der Kunst des Streichinstrumentenspiels (The Natural Fundamentals of the Art of Playing String Instruments), Berlin 1925; J. Winkler, Die Technik des Geigenspiels (The Technic of Violin Playing), Vienna 1922.

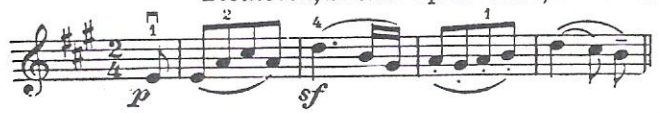
*) Many years ago in Berlin I attended a private concert of the Bohemian String Quartet with the late Oskar Nedbal playing viola. Carried away by his phenomenal tone production I decided to look more closely into his manner of holding the bow. I was hugely surprised to observe that he held his bow contrary to every sensible rule. His thumb was jammed entirely into the opening of the nut—touching the latter with the middle of his flattened nail-joint—instead of the tip.

**) By this is meant the incline of the bow-stick in the direction of the finger-board, in contrast to the non-inclined bow, with the stick held vertically and approximately at right angle above the string. With this however, it is not implied by any means that the inclined position of the bow is to be condemned. It is entirely dependent upon the degree of tensity of the bow. Strong tension—decidedly strong incline (Kreisler, Thibaud). Less tension—less incline and then only during *p* (Heifetz, Elman).

pressions derived from such as are used for other organs of perception. We speak of a bright or dull, clear or dark, full or hollow, large or thin, sweet or harsh tone. Sight, taste, smell, sense of touch and emotions of life in general, must serve as a guide to interpret the impression, which in reality is only perceived by the ear. The possible appraisable values of a purely acoustic nature, on the other hand, are considerably less numerous and of a much more primitive kind. Strong and weak, pure, scratchy or whistling, are about all that our language offers for the elucidation of audible impressions. Therefore, in the case of differentiating opinions as to sound, we are forced, so to say, to transpose our acoustic impressions into a form of terminology used for other organs of perception in order to make ourselves understood. This sound valuation however, leading into the aesthetic domain, is rather more harmful than serviceable for teaching. As an example, how is the pupil to understand a remark such as: "The tone is not radiant enough," if at the same time he is not informed how the corresponding mechanical correction is to be carried through and if knowledge of context between mechanics and aesthetics has not constituted a considerable part of his violinistic education from the very start? In literary criticism no objection is to be offered against the "flowery" style. In the course of professional teaching however, we must try to formulate our opinion as simply and clearly as possible and limit it, to begin with, to those palpable and audible reasons which interfere with the production of a pure tone.

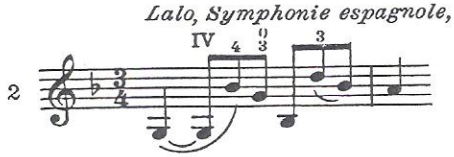
With this precept we approach the very kernel of the problem of sound. The question arises: Of what nature are the technical needs which are directly responsible for tone-production? Before proceeding to answer this we must establish, that above all, the indications provided by the composer must be considered and realized:

Beethoven, Sonata Op. 12 No. 1, II Mov't.

1 

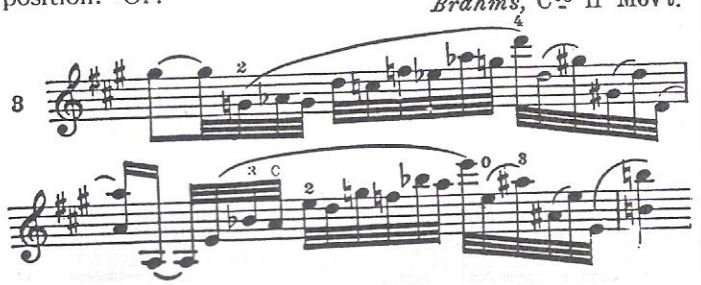
In the first measure the composer has written *p*, and in the second *sfz*. Furthermore, in the first measure we notice four slurred notes in one bow, while in a similar figure in the third measure the individual notes are to be separated from each other. Therefore the tonal realization of this example, above all, is dependent upon the prescribed dynamics and articulation, upon the difference between legato and non legato, between *p* and *sfz*. Or:

Lalo, Symphonie espagnole, IV Mov't.

2 

Here the tonal problem consists in the sudden change of position. Or:

Brahms, Cto II Mov't.

3 

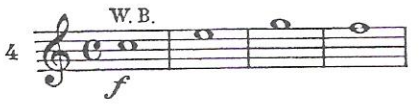
Here the tonal problem lies in the alternation of long and short strokes of the bow.

Therefore, it can readily be seen that tonal realization is dependent in the first place upon dynamics or articulation, as indicated by the composer.

The purity and regularity of string vibrations necessary for the production of perfect sound, apart from right-angle proportions between bow and strings, depends primarily upon the bow setting the strings into vibration at the right place, that is, at the correct *point of contact.**) The latter is dependent upon three factors: time duration of the stroke, prescribed tonal volume and height of position. On this account the point of contact is subject to constant change. The following examples may serve to bring about closer understanding of their nature and they are to be practised not only as prescribed, but also tried out in the opposite faulty manner, as counter-tests:

I. Duration of the bow-stroke.

Long spun stroke, point of contact near the bridge.

4 

(Counter-test: on the fingerboard; result—break in tone.)

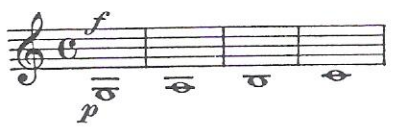
Short (rapid) whole-bow-stroke, near the fingerboard

4a 

(Counter-test; at the bridge—hoarse scratching)

II. Tonal Volume.

f near the bridge:

4b 

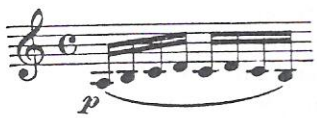
(Counter-test: on the fingerboard—break in tone)

p near the fingerboard.

(Counter-test: at the bridge—hoarse scratching)

III. Height of Position.

Lower positions, between bridge and fingerboard

4c 

(Counter-test: too near the bridge or fingerboard—Ponticello-character or break in tone.)

Higher Positions *at the Bridge:*

4d 

(Counter-test: at the fingerboard—break in tone.)

Let us review:

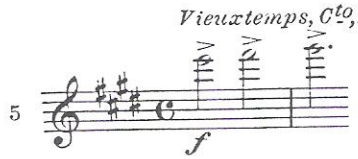
Long Stroke, *forte*, High Positions } near the bridge.

Short Stroke, *piano*, Low Positions } near the fingerboard.

*) Flesch, The Art of Violin Playing, Book One, page 81 ff.

The most important problem to be solved now, is whether the necessary bow-pressure establishes the point of contact, or whether the latter, perforce, determines a certain definite pressure. Which, in this case is f i r s t and which s e c o n d a r y? Must the bow pressure in the following example accommodate itself to the point of contact or v i c e v e r s a?

Vieuxtemps, C^to, E Maj. I Mov't.



Here without doubt there exists a reciprocal effect in-so-far, as the height of position — the *forte*, demands approach to the bridge, which without a certain pressure, would result in a ponticello-like tonal effect. Therefore nearness to the bridge in this case peremptorily demands bow pressure. However, the latter itself and under stated conditions, is only possible in the immediate neighborhood of the bridge. The answer to this question may appear unimportant at first thought, although in reality it constitutes the very essence of the whole problem. This may be corroborated by a practical example as follows: When a violinistin playing a long-sustained tone, does so with excessive pressure upon the string which the latter cannot resist, it will cause the tone to break. This in colloquial violinistic parlance is known as "forcing the tone." The typical observation of the critical listener in such cases will generally be: "Do not press so strongly." This manner of expression is misleading and falsifies the facts. It should be worded: "Press at the correct point of contact!" The string was not set into perfect vibration simply because the pressure was exerted at a point too far away from the end of the string, the bridge and where the string could not resist sufficiently. The opposite example to be mentioned is the "scratchy détaché," the tonal shortcomings of which are caused by bowing too closely to the bridge. The surpassing significance of t h e p o i n t o f c o n t a c t, as far as tone-production is concerned,—bow-arm pressure as c o n s e q u e n c e of the point of contact and not as a pre-condition—both belong to the most important findings of modern pedagogy.

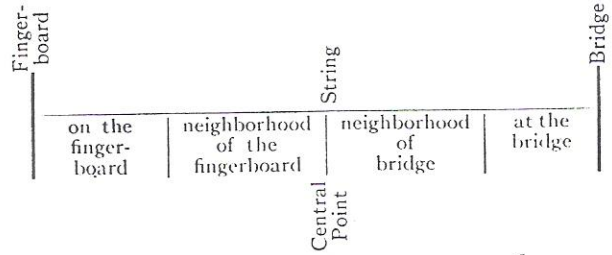
In other respects the importance of bow pressure for production of tonal v o l u m e is, in most cases, considerably over-estimated.*) The "strong" tone is produced during long sustained bowing, firstly, by approaching the bridge. In principle the bow at all times, should be pressed down only so far as the particular point of contact, together with the prescribed nuance, may demand, but never more. Here again, of course the personality of the player will point the way. S a r a s a t e was the typical representative among those who favored a point of contact nearer the fingerboard; he played with liberal bow length and weaker pressure, where-as K r e i s l e r favors approach to the bridge with resulting stronger pressure and less bow length. If he were to be forced to play in the manner of Sarasate, it would result in a weakening of his expressive ability. Just as the personality of the player is the deciding factor as far as interpretation itself is concerned, just so is the region of the point of contact, up to a certain extent, decided by the individual temperament of the player. Intensity of expression seeks the neighborhood of the bridge, whereas elegance strives towards the fingerboard.

If a violinist is in the bad habit of conveying intensive feeling, above all, through increased bow pressure, instead of doing so through approach to the bridge, his mere endeavor will not suffice to bring about a change. The following exercise (which I believe to be an entirely new one of its kind) will, in my estimation work wonders at times: Spun tones as near as possible to the bridge, however without scratchy accompanying noises (that is, well-sounding) and doing this *pp* or at least *p* for one-half hour daily.*) Owing to the elimination of bow pressure, the importance of bridge proximity as a prime factor for gaining intensity of expression, is brought within immediate grasp, so to say of our muscular sensibilities.

The special manner of applying bow-pressure is very closely connected with the tension of the bow.**) The fact that there are exceedingly prominent violinists who play with a highly tensed bow, and others again who prefer a weaker tension, sufficiently proves, that both are matters of individuality. It is important however, that with the stronger tension, an equally pronounced edgewise position of the bow be adopted, because otherwise the bow-arm pressure will go astray, so to speak, and will get beyond control. Weak tension on the other hand, calls for a straight (upright) position of the bow as otherwise the wood of the stick will touch the string. Guided by my teaching experience, I leave it to every pupil to decide for one of the two ways himself, taking for granted however, that the weak tension is not exaggerated to such an extent, that one must forego use of the spring bow.

However, if we wish to apply the point of contact theory to some individual case, we must, above all and for the sake of interpretational clarity, endeavor to designate more precisely the various parts of the string situated between the bridge and fingerboard. Here it is possible to distinguish five typical parts:

I. At the bridge (Br.).
II. In the neighborhood of the bridge (between bridge and central point) } (Brn.)
III. At the central point (Cp.)
IV. In the neighborhood of the fingerboard (between the fingerboard and central point) } (Fbn.)
V. At the fingerboard (Fb.)



It seems hardly necessary to point in particular to the fact that these designations must not be taken too literally. They merely serve for the purpose of orientation and approximate direction. They melt into each other and emerge from within each other. However with their help it is possible to localize and establish more precisely the vague ideas hitherto existing as to so-called "hard" or "weak" parts of the string.

*) Credit as the first one to have formulated this opinion, is due to Trendelenburg (Die natürlichen Grundlagen der Kunst des Streichinstrumentenspiels—The Natural Fundamentals of the Art of Playing String Instruments—Berlin 1925).

*) Not to be mistaken for the so-called "mute spun bowings", see page 15 (VI Tone Production and Bowing Varieties).

**) Flesch, "The Art of Violin Playing", Book I, pages 58, 88.

III. TONE-PRODUCTION AND EQUIPMENT FOR PLAYING.*)

In our tone-production we are dependent not only upon the enlivening spirit of our own skill, but to a certain extent upon the qualities of the playing material we use. Above all this includes the instrument itself, furthermore the strings with regard to their quality, thickness and purity, then the height, curve and position of the bridge, as well as elasticity, weight and hair of the bow.

Quality of the instrument is not, as often asserted, a decisive factor in regard to tone-production. The latter, to begin with, is dependent upon the player himself. At best the instrument may assist him in his endeavors. Every violin has its own peculiar brilliant or veiled tonal quality, which must not be allowed to develop into any extreme if the brilliant is not to become sharp, and the veiled quality dull. Any modification of these fundamental tonal qualities through efforts of the player is beyond reach of possibility. In the selection of an instrument he must therefore and above all, consult his own personal taste. A violinist who prefers the soprano-like timbre, will never feel satisfied with an instrument the tone of which will remind him of an alto voice and with the use of which he will not be able to realize his own inner tonal conception. Furthermore, attention must be given to ready tonal response. Violins which do not respond easily, are apt to require otherwise unnecessary stronger bow pressure, which aside from resultant tonal drawbacks will call for extreme exertion on the part of the player. Tonal evenness of the individual strings, as well, is important. With instruments which are too thin in wood, the higher tones are mostly too sharp, the lower ones too dull. Any adjustment by the player himself cannot be achieved. An extended discussion of the tonal qualifications of individual violin makers of certain schools or groups of makers would lead us too far astray. A few comments should suffice.

Violins by Antonius Stradivarius demand delicate, considerate treatment, while those by Guarnerius del Gesu, will stand not only energetic attack, but really require it. The sweeter, more flexible-toned Amati instruments, are not equal to the spacious reaches of present-day concert halls, nor do they suffice for the requirements of the modern repertoire. They have therefore lost prestige and to some extent are less in demand by concert players. A well-preserved J. B. Guadagnini, or a not too greatly arched Petrus Guarnerius or Montagnana can, under certain conditions serve as a substitute of equal value for a Stradivarius or Guarnerius del Gesu. On the other hand violins by the extensive Gagliano family in general are of too brittle a tonal quality. They represent the Italian factory violins of the 18th Century. Without question I would personally prefer an "unbaked" Vuillaume (say of the years 1820-30 or 1860-75) to them. The Lupots, in spite of their high material value have not stood the test as to tone. Generally speaking the purchase of a French violin, made between 1830-70 should be carefully considered owing to the frequent use of artificially prepared wood in their construction. On the other hand I believe modern Italian makers such as Rocca and Pressenda, to hold forth certain future promise. Great care should be exercised however, in purchasing any instruments presumably made by these two masters, as they are frequently mistaken for those by d'Espine who does not rank quite as high; besides the first-mentioned makers (Rocca and Pressenda) regardless of their relatively recent activities, have already gained favor amongst imitators and falsifiers. Violins made by Viennese makers at the beginning of the last century have not been "discovered" as yet, but with such as the above-mentioned they constitute a valuable reserve for the future.

It seems hardly possible for me to express an opinion as to the art of violin making of our time and tonal results gained through same. Assuredly there must be new violins the tonal properties of which can also satisfy discriminating violinists, the lasting tonal value of an instrument however, depends less upon momentary impression than upon its tonal properties which it may develop in the course of years. The "baked" Vuillaume violins, for example, were noble sounding instruments directly after their completion; only after a number of years it became apparent that the artificial drying of the wood-fibres had simultaneously caused a gradual drying up of the tonal spirit as well. In judging new instruments, the consideration of what the future may have in store for them, is of greater importance than present impressions; therefore the uncertainty of trying to express an opinion about modern instruments.

The easy response of a violin can be considerably furthered through good care of the instrument. Vibration of the wood is hampered through accumulation of hardened dust. Furthermore, the body of the violin should never be touched by the hands; it is best to take hold of it either at the scroll, tail-piece button or middle bouts, as in this way no finger-prints will show on the top or back. Keeping the instrument clean requires three-fold attention: frequent daily removal of rosin dust from the top with a soft silken cloth; removal of accumulated rosin crust from the strings with the help of a few drops of Cologne water, applied with a soft rag or cloth but taking great care not to touch the varnish of the wood therewith (two or three times a week) and removal of dust from the inner parts of the instrument, through pouring in and shaking around of slightly warmed rice grains (every six to eight weeks.)

As to selection of strings, their correct degree of thickness in comparison to each other is to be observed above all. Too thick a G string will favor the appearance of ever latent "wolf-tones" and in addition will not respond readily in the higher positions. The aluminum covered D is preferable by all means to the gut string owing to tonal reasons (here the matter of thickness is of smaller account). Too thin an A string will cause considerable tonal trouble, it will fail to resist the bow pressure; its tone lacks consistence and is liable to break. Within the last fifteen years the steel E string has definitely displaced the gut string. Tonal deficiencies cannot be proven and the resultant advantages for public performance are beyond praise. Quality of the steel itself is almost uniform at all times; their thickness alone, which wavers around ¼ m. m. is an important consideration. In a general way, it may be stated that the disadvantage of strings which are too thick, is that they require too strong a bow pressure, while the disadvantage of those which are too thin is, that they will not withstand a normal degree of bow pressure.

*) Flesch, The Art of Violin Playing, Book I, pages 7—74.

One should always endeavor to play in normal pitch, as established with a tuning fork. Aside from uncertainties of intonation occasioned by changes in fundamental pitch, the instrument itself will suffer through the constantly changing degree of pressure by both strings and bridge upon the top.

Height of the bridge and connected therewith the relative height of the strings from the fingerboard, influences tone formation to a greater extent than one is apt to imagine. With too low a bridge the tone will incline towards shrillness, if too high towards dullness. Strings which lie too low will rattle during energetic bowing; if too high, and while playing in the upper positions, their level is apt to be too sloping; this in turn will favor touching and sounding of the neighboring strings and particularly so if the point of contact approaches the fingerboard. Height of the bridge is also frequently established, perforce, by the position of the neck. If the latter has been inserted in a slanting position, too high a bridge and too low a finger board will be the inevitable consequence. However, if the neck has been inserted in too straight a position it will result in too low a bridge and the strings will be too near the fingerboard. In such cases, instrument makers, as a rule, will recommend the splicing on of a new neck. In my opinion particularly with less valuable violins, the insertion of a thin chip of wood, neatly adjusted between the fingerboard and neck or a slight scraping, or thinning out of the latter, should suffice. Rounding of the upper edge of the bridge requires great care. If curved too little, the neighboring strings are easily sounded along; if arched too much, the level of the middle strings will come too high. Thickness of the bridge must be gauged by, and adjusted in accordance with the tonal individuality of the instrument. An instrument of dark tonal timbre requires a thinner bridge than one of brighter timbre. Position of the bridge on the top is determined above all, by the measurements of the instrument, that is according to the correct proportion between the entire length of the strings and length of the neck. The proportionate relationship between bridge and sound-post as well, is important; the nearer that both are placed together, the brighter, the further away from each other, the darker will the tonal character of the instrument become. The angle which the bridge must form to the top, is principally dependent upon the manner in which the feet of the bridge are cut, or rather fitted to the instrument. At any rate the bridge must not be allowed to bend forward.

Tone-production is unfavorably influenced above all, by the stick of the bow if same is too flexible or too stiff. If too flexible, edging of the bow becomes impossible, if too stiff the want of elasticity is communicated to the sound. Weight of the bow at its middle amounts to about 58 g. Too light a bow requires too strong a pressure, whereas too heavy a bow will cause a deal of trouble in mastering the technics of bowing near the frog.

By rights every teacher should supervise the regular renewal of bow-hair for his pupils; otherwise it may happen that he will be at a loss to understand a rather mysterious gradual diminishing of tonal volume in the pupil's playing, until he accidentally discovers that the bow hairs have not been renewed for six months. Such negligence may bring about unfortunate results for the pupil, owing to the fact that the mechanics of tone-production in his case may be forced into entirely faulty paths owing to the excessive pressure necessitated by the failure of the hair to grip the string. The hair should be rubbed at regular intervals with rosin. There are pupils who do this only once a day, but then so liberally as to last for the whole day; as a natural result a normal tone cannot be produced under such conditions, until the superfluous rosin, has, in the true sense of the word, been "scratched off."

The stick of the bow will swing along easier and with readier response if cleaned at regular intervals.

Despite the importance of the material (violin and bow) as used for tone-production, the violinist must guard against holding the instrument responsible for tonal shortcomings for which he himself is to blame. Poor excuses of this kind are liable to nip his tonal development in the bud.

The chin rest*) and cushion**) as well, influence tone-production to a certain extent. Doing away with the chin rest brings about direct contact between the lower jaw and top of the instrument and causes the wood at that point to wear out prematurely. Then the pressure upon the tail-piece with resultant unsteadiness in pitch of the strings and above all eliminated vibration of the lower part of the top through pressure upon it by the jaw, will cause considerably diminished tonal volume.

The feeling of being able to play more soulfully without a chinrest, is entirely subjective and is not shared by the objective listener. In the same way, non-use of a cushion, as a matter of principle cannot in all cases be carried through. Either the space between jaw and collar-bone is filled by the height of the bouts plus chin rest—in which case the player needs no cushion—; or a considerable vacuum remains, necessitating a cushion; lifting the shoulder to assist in such cases will always remain a questionable expedient.

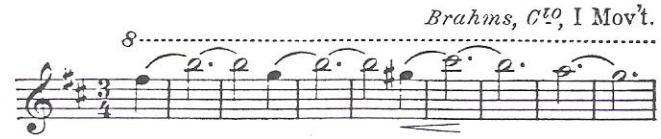
Holding and Position***) of the instrument can influence tone-formation in a variety of ways.

I. Height at which the violin is held.

a) Low Position.

Holding the violin too low will naturally force the bow to slip towards the finger board, causing faulty point of contact in all cases demanding approach to the bridge, f. i.

Brahms, C^to, I Mov't.

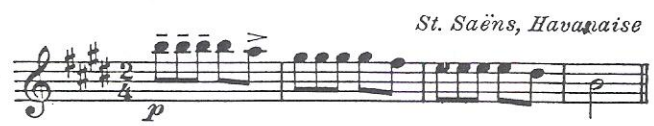


The four-lined C sharp cannot possibly be produced on an instrument in too low-hanging a position, the tone must break.

b) High Position.

Here use of the point of contact near the fingerboard (Flautato) is again rendered difficult owing to the bow's tendency to slip in the direction of the bridge, f.i.:

St. Saëns, Havanaise



II. Plane of the violin.

a) Holding at too flat a plane.

Will cause difficulty in tone-production upon the lower strings owing to forced, excessive lifting of the right arm and shoulder; in addition calls for unnatural turning of the left arm towards the right.

*) Flesch, The Art of Violin Playing, Book I, page 16.
**) The same, Book I, page 15.
***) The same, Book I. page 15.

b) Acute Angular Position.

Impossible for players with protruding abdomen, as through this, the bow-arm on level of the E string is hindered in its necessary movements. While tone-production upon the lower strings is rendered more convenient, there will always be a tendency for the left-hand fingers to slip while playing upon the E string.

III. Direction in which the violin is held.

a) Position towards the left.

Seemingly the stroke is going backward with consequent slipping of the bow upon the fingerboard and faulty point of contact as with number I. On the other hand to be recommended for players with abnormally long arms.

b) Position towards the right.

If this is not exaggerated, it cannot be objected to, especially in the case of players whose arms are too short, because in this position the bow can find the exact point of contact it needs more easily.

Therefore, direction in which the violin is held depends to a great extent upon length of the arm. With too long an arm, inclination towards the left, if too short, inclination towards the right is to be recommended.

Position of the head upon the instrument has already been discussed by me in "The Art of Violin Playing" in detail, and from the most diversified points of view.*) Only so much should be mentioned here, that the inclined head position influences the tone-production itself to a less extent than the subjective impression we receive from it. The closer we bring our ear to the instrument the fuller and more impressive the tone appears to us; in reality it frequently seems weaker to the objective listener, than with straight head position. However, the inclined head position, through the inspiring manner in which it acts upon the player, creates a stimulus which, particularly during momentary spiritual indisposition, is not to be underestimated.

IV. TONE-PRODUCTION AND LEFT-HAND TECHNIC.

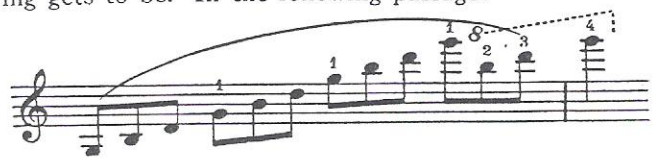
Setting of the left-hand fingers**) is apt in two-fold a manner, to affect tone-production unfavorably: through too weak or too strong a pressure. In the first case the strings are not shortened precisely enough and the tone will sound undecided and flabby. This shortcoming, however is most noticeable amongst beginners; advanced players are liable to suffer from the opposite ailment, excessively strong finger pressure, which may manifest itself either through rigid inelastic pressure or through elastic, though exaggerated darting of the fingers. Too much finger pressure causes glassy, brittle tone quality, and diminishes freedom of the Vibrato; furthermore it will injure the tonal volume by diverting a part of the right arm's power of expression, to say nothing about disturbing, knocking noises, caused by the falling fingers; in connection with the latter, the danger of injuring the nerves at the finger tips must not be over-looked.

Tone quality is furthermore influenced through flat or pointed setting of the fingers. If the string is touched with the inner fleshy part of the finger tip, a much softer tone color will be produced than when the setting takes place with the tip in the neighborhood of the nail. Therefore the excessive "drawing in" of the left arm (towards the right) brings with it not only the danger of the finger slipping away from the E string, but of the tone color itself becoming hard and inflexible.

Apparently intonation*) and sound effect are only loosely connected. However, tone-production loses through imperfect intonation, inasmuch as our satisfaction at hearing a beautiful sound will be considerably lessened through deviation from correct pitch, without our being conscious at all times of the real cause. Moreover sympathetic vibration of the open strings, which is apt to ennoble the tonal quality to so considerable an extent, will be interfered with. Therefore, intonation which is either too high or too low, will offend our aural as well as our tonal sense.

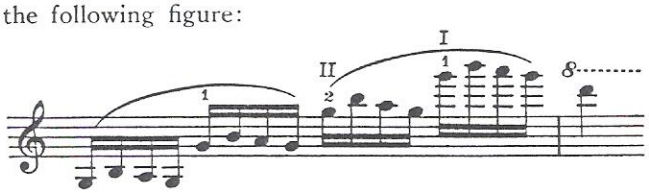
The relations between position—respectively change of position**) and pure sound, are of greatest importance for tone-production. We know that the point of contact must be advanced towards the bridge, the shorter the string gets to be. In the following passage:

8



the point of contact at the start is, towards the middle, only to approach little by little almost up to the bridge. The contention that in the course of a stroke, the retention of the same point of contact is necessary in every case is sheer nonsense. The break of high end notes in passages is invariably the result of too slight an approach to the bridge. The necessary change in point of contact with either even or increasing tonal strength is also to be watched in the following figure:

9

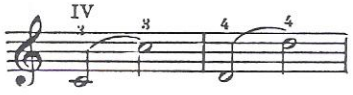


The correct execution of this example alone will suffice to disprove the precept, met with in so many, otherwise good instruction books, as to the necessary unchangeable point of contact to be observed in the course of a stroke; because there is no doubt, that the four-lined G can only be produced quite close to the bridge, while the attack on the open G string must take place at the central point.

Were we to begin this tonal sequence *piano* and end with *forte*, the difference as to the point of contact would be even greater, while only in the gradation from *forte* to *piano*, the point of contact would remain approximately the same. Therefore, every position study may serve simultaneously, as a tone—respectively a point of contact study. Violinists, who have become accustomed to a point of contact, too near the fingerboard, will do well to transpose simple exercises one octave higher, and in this way force approach to the bridge.

Changing the point of contact is even more striking during the Portamento***):

10



Faulty increase and decrease during the Portamento

*) Flesch, The Art of Violin Playing, Book I, page 16; Book II, page 67.
**) Flesch, The Art of Violin Playing, Book I, page 18.

*) The same, Book I, pages 20, 103.
**) Flesch, The same, Book I, page 25.
***) Flesch, The Art of Violin Playing, Book I, page 29.

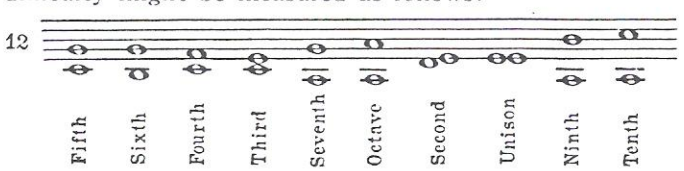
11 

is to be condemned not only from a musical point of view. Usually this poor habit is combined with a stubborn retention of the point of contact, in the course of which the increased pressure will strike a part of the string offering slight resistance and resulting in the flat tonal character peculiar to this manner of playing (see Appendix 13-19).

The nature of the Vibrato*) is more determinative for the intimate spiritual make-up of the tone than for sound production in the physical sense. Theoretically the pure tone is also possible without Vibrato; however, for the listener, it will sound poor and expressionless, excepting in case of some emotional complex, deprived intentionally of purely sensual ingredients. Tone-production, as such is mainly influenced by the Vibrato in-as-much as an all-too intensive Vibrato will weaken the tone formation through the right arm. Faulty or ineffective Vibrato, on the other hand, strengthens the inclination for tone formation through extreme participation of the right arm and consequently misleads to forcing the tone. The theory discovered and demonstrated by me about the fundamental necessity for equal share of the two arms in expressive playing, respectively between sound production and vibrato, saves the necessity of discussing this important subject in closer detail.**)

The use of Vibrato during *passages* mainly introduced by *Kreisler*, signifies one of the most important achievements of modern violinistic art. Different opinions as to its aesthetic justification may be expressed. However, certain it is, that it answers the taste of the times and is already valued as one of the indispensable constituent parts of contemporary playing. Considered from a purely tonal point of view, it does away, above all, with that dry etude-like character during détaché bowing, which is apt to let passage work of this kind appear as foreign matter in the organism of the living art work. Its application, in accordance with the law pertaining to even apportionment for expressive strength in both arms, causes an automatic diminution of right arm pressure, and on this account is unusually valuable for violinists who habitually force the tone.

Tone-production during the playing of double-stops***) becomes increasingly difficult the more the two tones are separated from each other. In this respect the scale of difficulty might be measured as follows:

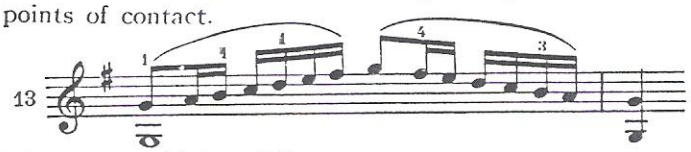
12 

The question here concerns equalizing of two individually different points of contact. As an example let us take the

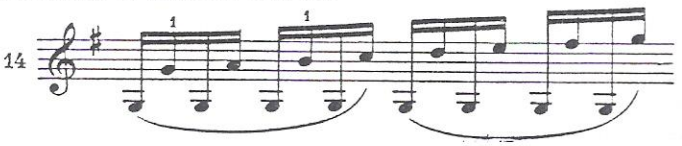
a—C^2 12a 

Here the point of contact for *a* (supposing one stroke of probably two seconds duration in *mf)* is approximately at the central point, that for C^2 however in the neighborhood of the bridge. Here a line of adjustment between the first and sixth positions must be found, but following the upper, rather more than the lower note. The frequent break in tone in such cases, is mostly caused by the point of contact being influenced too much by the lower note and consequently being too far away from the bridge (See Appendix 28-31).

Then there is the so-called bag-pipe effect,*) simultaneous sounding of an open string with higher tones on a neighboring string. Phantastic differences in position playing can be obta ned there-with and it provides one of the most valuable exercises for equalizing two different points of contact.

13 

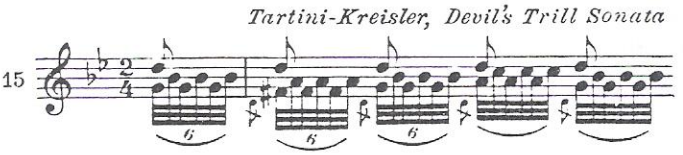
The same divided as follows:

14 

(see Appendix 35-40).

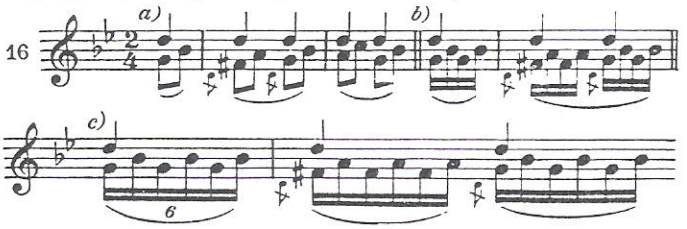
The frequent break in sound during trills and left-hand tremolo**) is caused by the great rapidity in the change of the two notes; a difficulty which becomes even more apparent with trills in double-stops. The best-known example of this kind in the violin repertoire is to be found in *Kreisler's* Cadenza to Tartini's "Devil's-Trill Sonata."

Tartini-Kreisler, Devil's Trill Sonata

15 

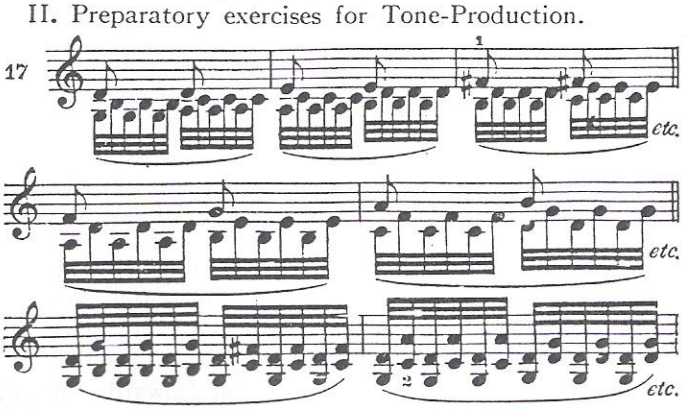
This exceedingly difficult tonal problem may be mastered in the speediest and most practical manner as follows:

I. Isolation of, and specialized study for the left hand

16 

This exercise is to be practised until the tonal groups are known by heart; after this the player is not bound to follow the printed page any more and can control the point of contact with his eye.

II. Preparatory exercises for Tone-Production.

17 

and similar combinations.

*) Flesch, The same, Book I, page 35.
**) Flesch, The Art of Violin Playing, Book I, page 100.
***) The same, Book I, page 83.

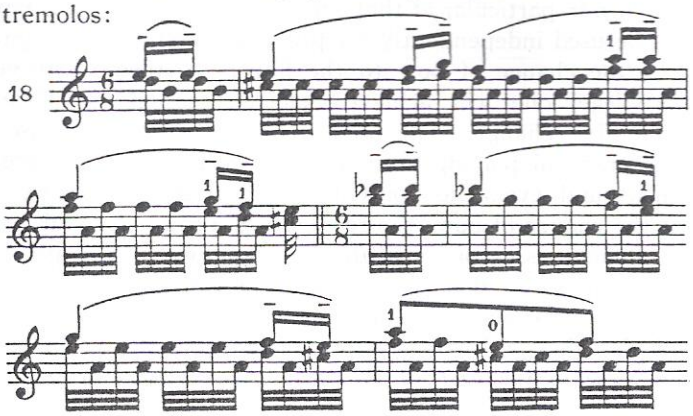
*) The same, Book I, page 98.
**) Flesch, The Art of Violin Playing, Book I, page 45.

III. Study of the Original Version.

With II and III the following proceedings are to be observed: continued visual control of the point of contact, slight bow length, strong pressure, short accented tremolos with separating pauses (see Appendix 32-34).

In the second movement of Mendelssohn's Concerto we find a combination of high position passages and double-stop tremolos:

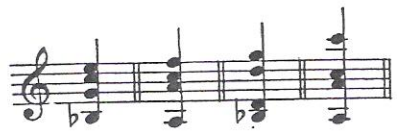
18



The fact that this combination is so difficult to transpose into a pure sound, proves its value as a tonal study (see Appendix 37-38).

Chord Playing,*) both as to technic of the bow, as well as to tonal realization, constitutes a chapter all its own. The simultaneous sounding of tones of different height, is known as a chord. Owing to the arched position of the strings on the violin, such simultaneous sounding is only possible with comparatively short strokes, because the point of contact will then approach the neighborhood of the flat part of the fingerboard. For longer sustained chords we would have to approach the neighborhood of the bridge, only to find that there again, the arching is too round. This dilemma cannot be prevented. It is claimed that in *Bach's* time it had been possible to sound and sustain the four-toned chords in his Sonatas for violin solo, simultaneously. This, as the saying goes, could be done, owing to the convex (up-ward rounding) bow stick, which enabled fitting of the hair to the strings through regulation by the thumb. This I consider a legend. I will not question the technical possibility of bowing in such a manner,—but how could simultaneously sustained chords, such as the following, have been playable, if we take into consideration the niveau of *left* hand technic in the pre-Viotti period?

19



Certainly not with help of the thumb! Therefore, of what use is the possibility of such bowing, if the left-hand technic must fail? Could it be possible that Bach should have really known so little about violin technic, as to expect from violinists the simultaneous sounding of a sustained chord, which cannot be stopped simultaneously by the left-hand fingers? In my opinion even Bach in his time had already reckoned with the necessity of the break in four-tone chords.

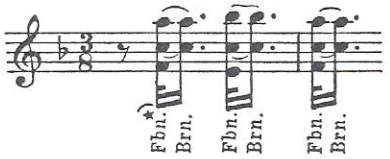
The playing of three-tone chords depends upon length of the stroke.

20

*) Flesch, The Art of Violin Playing, Book I, page 83.

These chords can be played with **simultaneous sounding** of the three tones, near the fingerboard in an approximate tempo of ♪= 100 however, in slower tempo, say ♪= 50 they are to be broken as follows:

21

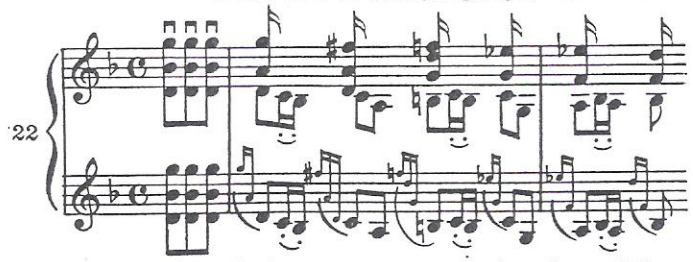


Therefore, in such a case a change of point of contact must take place in the direction from fingerboard to bridge, and this for the following reasons: With the simultaneous sounding of the three strings, the point of contact will lie near the fingerboard, because the simultaneous grip upon the strings presupposes as flat a string position as possible. However the moment that the strings have been sounded, the bow must leave the lower string and set the two upper ones into vibration; this, in turn, results in a long-drawn double-stop and in consequence demands nearness to the bridge. Therefore, in this case a change of the point of contact is absolutely necessary. If this is neglected and if the three-voiced chord has already been started near the bridge, a simultaneous sounding will be impossible, while the tone will positively break if the point of contact is located near the fingerboard for the following double-stop. Observation of these rules, proven by fact, prevents a break in the two upper sustained notes of the chord, one of the most frequent of all tonal short-comings. We are dealing here with still another of those unhappy results of that senseless "theory" which advocates the immovable point of contact in the course of one and the same stroke.

The same rule applies to four-voiced chords, only that with these the break will be as follows: 21a  Chords, in which, for *musical* reasons, the lower voice is to dominate, are best played in the reversed order of the intervals.**)

Bach, Sonata No. 1, Fugue for Violin alone

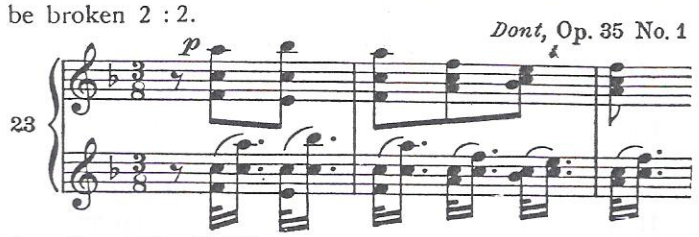
22



Chords to be played *piano* or *mf*, must under all conditions, be broken 2 : 2.

Dont, Op. 35 No. 1

23



(see Appendix 41-50).

Tonal realization of harmonics demands decided edging of the bow, elastic strokes, as slight a bow pressure as

*) *See page 18 for explanation of these abbreviations.*

**) Flesch, The Art of Violin Playing, Book I, page 83 (Carl Fischer,, Inc.) also Bach, G Sonatas and Partitas, edited by Carl Flesch (Edition Peters).

possible and light finger vibrato. For rapid harmonics at the nut, attention is to be given to spirited bowing, minus any attack; the strokes seemingly soaring "from above" and "taking the string along" in its flight so-to-say. But even with use of the whole bow, the rapid, be-winged drawing of its full length is the most important. Therefore, in case of long sustained harmonics, one should make an exception by disregarding the author's directions, and change the bow as frequently as may be necessary for perfect tonal realization.

V. TONE-PRODUCTION AND BOWING TECHNIC.

The method of holding the bow is apt to either simplify or complicate tone-production. I have indicated the various methods of placing the fingers upon the bow-stick, as the older, the Franco-Belgian and the Russian methods. The extended discussion of this matter in "The Art of Violin Playing" will save detailed explanation as to the technics of the bow involved.*)

Judged from an acoustic point of view, it might be observed that the tone produced with what I indicated (either justly or unjustly) as "the Russian manner" of holding the bow, is much rounder, than with a less advanced position of the index-finger; but under no condition must this finger rest upon the stick with the beginning of the third joint (measured from the nail-joint). Otherwise all benefits of holding the bow in this manner will be reversed, the tone becoming hard, unelastic and unfit for tonal modulation, the technic at the nut clumsy and the détaché at the point shaky. However, I usually leave it to the student himself, whether he wishes to use the Russian or Franco-Belgian manner of holding the bow. In this regard we meet with very decided idiosyncrasies (unconscious inner resistances) which one should respect. The same holds good as to tension of the bow, the strength of which is rather immaterial as far as tonal results are concerned (as proven in the case of numerous prominent violinists in favor of playing with stronger or weaker bow-tension). However, the only importance attaching to this point, which cannot be mentioned too often, is the need of an inclined position of the bow with strong, and a non-inclined position with weaker tension.

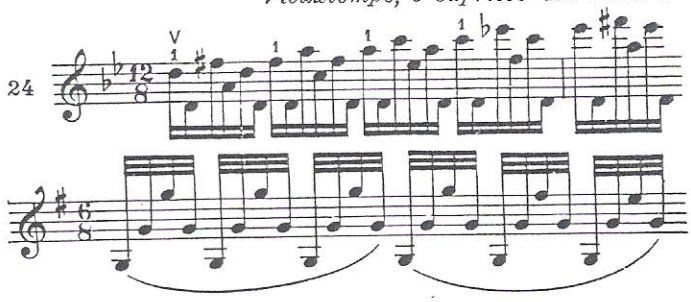
The tone can be unfavorably affected, particularly at the point, through too strong a bending of the thumb, as in this way there can be no possibility of inclining the bow at its upper half. In such a case the player is almost tempted to incline the bow in the wrong direction, which will bring about catastrophic tonal results.

Again the little finger through inflexible, rigid contact with the stick, can prevent the pronation (outward turning) of the upper arm, while playing with the upper half of the bow and in this way rob the tone-production of all the benefits, which the Russian method of holding the bow, has to offer. Only with the older method of holding the bow that is with the finger tips, does the resting of the little finger upon the stick seem natural and unconstrained. However, it is absolutely necessary not to do away with the aid of the little finger at the lower half of the bow because it is its pressure which brings about that particular supination (in-ward turning) which counteracts the superfluous weight of the frog, and enables a smooth, even change of bow. The action for such an adjusted smooth movement through means of the wrist and finger (finger-stroke) must be a minute one. I introduced the finger-stroke*) into violin pedagogics in my Ur-studien (Basic Studies) in 1910.**) Intended as a purely helpful gymnastic exercise, I had not imagined what damage it would come to, one of these days, at the hands of other theoreticians by making it the crucial point of bow technic. I had already warned in particular at that time, that this bowing was not to be used independently for practical playing. If assigning the change of bow to the fingers as their exclusive privilege, one will achieve exactly the opposite of an inaudible change. The finger-stroke must only be used for practical playing in connection with the wrist movement and even then only in minimal doses, because— if the change of bow is seen, it will also be heard!

Difficulties encountered during change of strings***) are principally due to bowing technicalities. The tonal obstacles are due to change in point of contact as a result of changing positions, to division of stroke, as well as to increase or decrease of pressure in accordance with the resistance of the individual strings.

Vieuxtemps, 6 Caprices No. 1 and 2

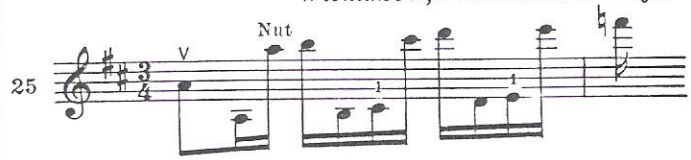
24



The only help to arrive at the necessary equalization, in this particular instance, will be visible control of the point of contact.

Wieniawski, Polonaise in D major

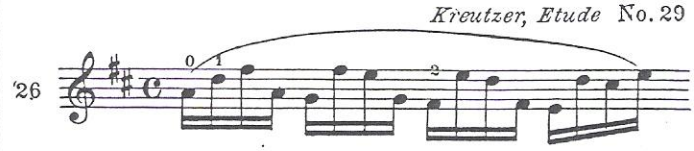
25



In this case one must endeavor to lessen the weight of the bow on the E string as much as possible through lifting it

Kreutzer, Etude No. 29

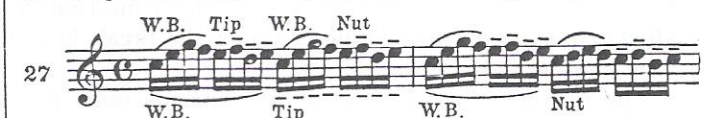
26



In this classic study for change of strings the long stroke necessitates suitable approach to the bridge (see Appendix 21-22).

Tonally, bow division****) interests us above all, owing to the varieties of pressure it calls for. Therefore mixed bowing varieties*****) in the following manner:

27



*) Flesch, The Art of Violin Playing, Book I, page 51.

*) Flesch, The Art of Violin Playing, Book I, page 58.
**) Flesch, Basic Studies (Carl Fischer, Inc.)
***) Flesch, The Art of Violin Playing, Book I, page 61.
****) Flesch, The same, Book I, page 156.
*****) The same, Book I, page 78.

are to be counted as amongst the best of tone studies; this because lifting at the nut through supination, pressure at the tip through pronation and the frictionless transition between both during the whole-bow stroke, offers considerable difficulties (see Appendix 23-24).

Therefore, the extreme sections of the bow in detached strokes, should be avoided as much as possible; the player should choose that part of the bow for executing all bowing varieties belonging to the détaché family, which will set the string into regular vibration through its own weight in the neighborhood of its center of gravity, that is, approximately at the third quarter, between the middle and tip.

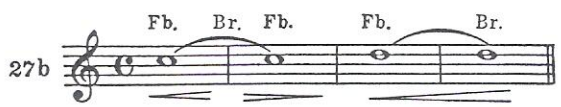
VI. TONE-PRODUCTION AND BOWING VARIETIES

Long-sustained tones in one bow, so-called spun tones* require approach to the bridge even during *piano*. The so-called flat quality of tone-production is caused through too distant a point of contact from the bridge. On the other hand, in approaching the bridge too closely, a warning signal in form of ponticello-like harmonics will be heard.

As a remedy for this dull tone-production it is advisable to practise inaudible long-spun strokes. With this we are to understand, long-drawn strokes in the immediate neighborhood of the bridge without the slightest pressure; this will produce a hardly audible ponticello-like noise, composed of over-tones, which has nothing in common any more with pure sound. The purpose of such exercises, to begin with, is to bring the general level of the point of contact closer to the bridge and secondly to make the stroke in the neighborhood of the bridge independent of bow pressure to a certain extent. They are not to be considered as regular practise material, but are merely conceived as corrective measures necessary from time to time and which lose their purpose the moment the desired task has been accomplished.

For instance, with spun tones like:

the tonal shading is not produced through change in the point of contact, say in the following manner:



(because duration of the long stroke will not allow of any removal from the bridge even in *piano*), but through gradually increasing pressure.

With increased rapidity of bowing, the point of contact will keep on changing towards the fingerboard until, in the course of the rapid whole-bow détaché it will end nearly on the fingerboard itself. With this the shading will be the deciding factor for the exact locating of the point of contact.

(see Appendix 1—12).

The legato stroke*) is subject to the same laws as the spun tone, but is even more difficult owing to the change in positions. With double-stops, the adjustment of the point of contact presents additional difficulties.

Perfected execution of the *detache***) generally fails owing to too great an approach to the bridge. Particularly with cellists does one hardly ever hear this bowing without accompanying noises. On the other hand violinists will often exert too much pressure in such cases. Exercises for the détaché in *p* are therefore to be highly recommended for everyone (see Appendix 25). Anyway, a light vibrato will diminish the bow pressure automatically. The orchestral custom of exaggerated use of long bows for the detaché, is also frequently adopted for solo performances, resulting in the typical effect and acoustic impression of "scraping." I am of opinion that in teaching the tonal result alone should be the only criterion. The noticeable change of bow during the détaché can best be remedied through the so-called French détaché.***)

During the *accented* whole-bow stroke attention is to be paid, that the quicker drawing of the bow, caused by the accent at the start, as well as the slower drawing at the end, will be suitably adjusted as to the changing point of contact between fingerboard and bridge; however, this must not be carried out within too great a space, and the functioning must be more around the central point (see Appendix 9—12)

The knowledge of the mechanical manipulation, necessary for the Martelé stroke****) is pre-supposed. The most frequent tonal shortcomings occurring therewith consists in the continuation of the pressure accent after the attack. In such cases the best remedy will be to isolate the Martelé stroke proper, from the pressure accent during the pressure pause. Here the point of contact is in the neighborhood of the fingerboard. An exception prevails during Staccato*****) playing, in-so-far that tonal realization is dependent, first of all upon correctly applied pressure and secondly upon the suitable point of contact. A scratchy staccato, though functioning correctly, is caused by a point of contact too near the fingerboard or bridge.

During the Portato†) as well, one must guard against applying the soft pressure characteristic of this particular bowing, too near the fingerboard. Otherwise the saliently educational results of this variety of bowing would be reversed in form of a flat tone-production (see Appendix26).

*) Flesch, The Art of Violin Playing, Book I, pages 65, 98.

*) Flesch, The Art of Violin Playing, Book I, page 65, 98.
**) The same, Book I, page 66.
***) The same, Book I, page 67.
****) The same, Book I, page 68.
*****) The same, Book I, page 69.
†) The same, Book I, page 73.

Knowledge of the difference between thrown and spring bowing varieties*) is taken for granted. Their relationship to one or the other category, to begin with, is decided in the main by the speed in which they are to be played: *slow* tempi—thrown bow, rapid tempi—*spring* bow. During the thrown bow at the middle there is tonal danger, first of all, if the bow is lifted too high, whereby the weight of the bow when falling back upon the string will prevent the free vibration of the string; furthermore in too decided a diminishing of horizontal bow-movement and finally in the choice of point of contact at too weak a part of the string, that is, too far away from the bridge. All this produces more of a noisy impact than regular vibrations. Height at which the bow is to be lifted is decided upon, above all, by the prescribed degree of brevity of the note. The higher the bow is lifted, the nearer the point of contact is to the bridge and vice versa.

With the legitimate (rapid) spring bow however, the hair should leave the string as little as possible. The leaping character of the individual notes must be brought about solely through the individual vibrations of the middle of the stick itself. The less the hair is lifted from the string during the spring bow, the more satisfactory will be the tonal result—a golden rule, which is taken to heart much too little. It should be added that in this manner, degrees of rapidity may be gained, which in lifting the bow from the string, will be unattainable, owing alone to the resultant loss of time caused thereby (see Appendix 27).

For the flying staccato**), as with the thrown bow, lifting of the bow is to be limited to the utmost, and with careful choosing of the point of contact. In the same way slow thrown arpeggios will obey the laws governing the thrown bow, and rapid *springing arpeggios* those of the spring bow.

VII. TONE-PRODUCTION AND DYNAMICS.

The fundamental elements***) of dynamics consist of *f*, *p*, *cresc.*, *decresc.*, *sfz*. The relation between these tonal shadings and the choice of their point of contact would be extremely simple, if same were not complicated through certain matters such as length of bowing and height of position. The forty-five dynamic fundamental types, yielded from a combination of these three factors, might be designated as a dynamic scale system (see the most important combinations in the Appendix 1—20).

To all appearances the fundamental tonal strength most suitable for technical study would seem to be *mf*, the medium strong tone. Around this, as prescribed by the composer or following out certain purposes of study, are grouped the various tonal gradations. I would deem it impractical to choose the soft or the strong tone in principle as the fundamental dynamic in case no other tonal shadings are wished for and to practise everything in *p* or *f*. This, for the very reason that dynamic changes with increasing or decreasing tonal radiance can be carried out most readily from *mf* on. Exceptions are brought about for definite technical purposes of bowing and tone-production; for a rough violinist, unconcerned as to any of the finer points of tone-production, a *piano* treatment would prove a healing cure, while reversely, substitution of healthy tone production for a whispering manner of playing will succeed most rapidly through cultivation of a more robust *f* tone.

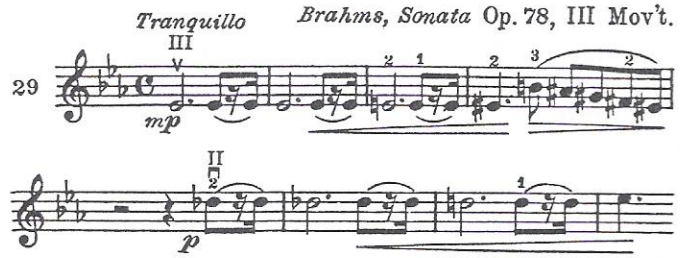
*) The same, Book I, page 73.
**) Flesch, The Art of Violin Playing, Book I, page 77.
***) The same, Book I, page 90.

VIII. TONE-PRODUCTION AND FINGERING.

The relationships between sound production and selection of fingering, are of such manifold variety that a detailed discussion of this subject would require an individual work in itself. While referring to the respective chapters on this subject in "The Art of Violin Playing"*), we will confine ourselves here to the formulation of several fundamental principles in condensed form:

I. The fingering as selected must accommodate itself first, to the musical, and only secondly to tonal needs.

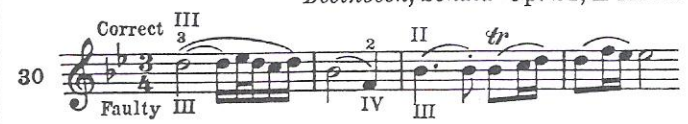
Tranquillo *Brahms, Sonata* Op. 78, III Mov't.



Here there is considerable temptation because of tone color to begin the phrase on the G string and to continue it in the fourth measure on the D string. Both would be wrong. In order to preserve the uniform character of the themes the tonal color must be limited to one string as much as possible and must not oscillate between the G and D, or D and A strings. Furthermore the muted character of the *mp* is better suited for the D, than for the heroic timbre of the G string.

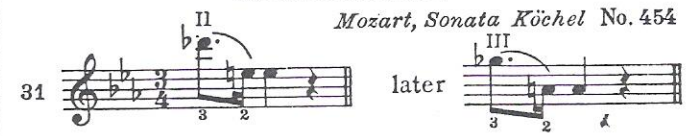
II. Owing to their peculiar dullness of sound the higher positions (from the VII. up) on the middle strings are to be used only in exceptional cases, even if their use were theoretically justified,

Beethoven, Sonata Op. 24, II Mov't.



On the other hand:

Mozart, Sonata Köchel No. 454

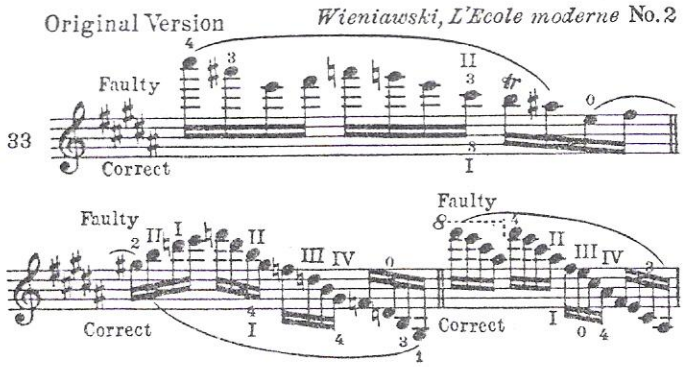


because here uniformity of tone color seems absolutely necessary.

III. In selecting a position one should differentiate strictly between study purposes and artistic rendition. Exercises such as the following are very useful for strengthening the fourth finger.

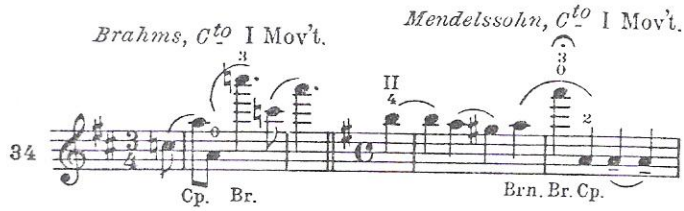
*) The same, Book I, page 144.

Playing in the same position, consistently carried through (as in Rode, 24 Caprices, Nos. 3, 9, 10) is extremely beneficial for the medium advanced player. For purely musical purposes, however, the fingering must be subordinated to the laws of phrasing, articulation, dynamics and sound formation. In particular the traditionally sanctified, convenient phrase "to remain in the position" tends, if literally followed, to bring about devastating sound effects. One should never hesitate in deciding upon a difficult change in position if the tonal picture can be brought to greater perfection through it.

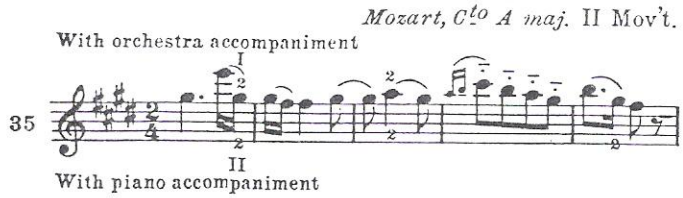


IV. With longer sustained tones in high positions, the third finger is to be used in place of the fourth, owing to stronger vibrato ability of the former.*)

V. In connecting two widely separated positions, the point of contact is to be suitably changed.



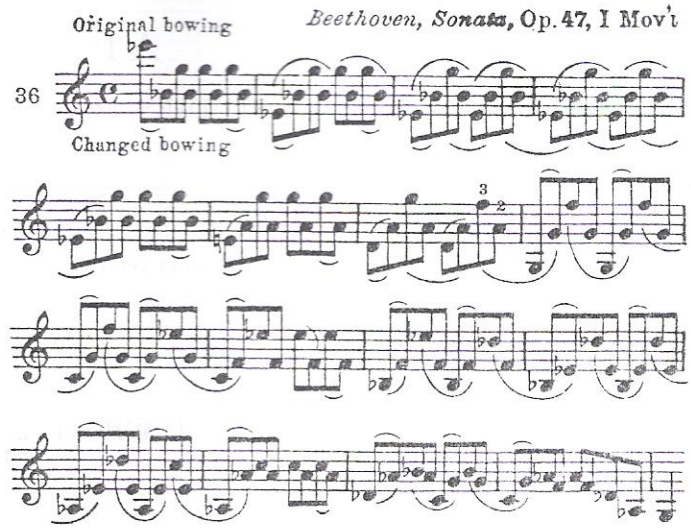
VI. The fingering must be adapted to the varying tonal volume of the accompanying orchestra or piano.



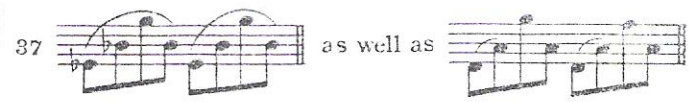
IX. TONE-PRODUCTION AND CHOICE OF BOWING VARIETIES.

Choice of bowing to begin with, must accommodate itself to the musical needs of a composition, secondly, to the demands of the composer, and then only to the requirements of sound. (The reason why articulation as prescribed by the composer has been mentioned here in second place, is that often it is considered from a pianistic point of view and that it is frequently impossible for a string instrument player to execute it in this way.) If a bowing variety in its original version is not effective, a better one may be substituted for it, however, without changing the spirit of the original articulation.

*) Flesch, The Art of Violin Playing, Book I, pages 117, 128.



Musically considered the rhythmical accentuation of the bass notes in this example demands first attention. On the other hand figures such as the following,



can hardly be realized in a satisfactory way owing to the prescribed tempo and the rather awkwardly mixed stroke. The suggested changes in bowing will therefore be readily understood without further comment.

The fundamental principles as developed and proven through practical examples in the above explanatory comments are completed in the appendix through a series of tonal studies suitable for daily use.

Although the faculty of emotion is rated higher than that of perfect sound, a certain connection exists between them, in so far that sound production is capable of influencing the inner disposition of the player either in an enlivening or prosaic sense. Our ability of expression is stimulated through inspiring sound and through it can be guided to heights which otherwise would remain unattainable. Therefore sound production constitutes not only a part of the total *technical* system of violin playing, but beyond this is responsible for the important duty of favorably influencing the artistic emotional faculty itself. This problem can be solved only when the violinist has become accustomed from the start, through proper training, to consider free and independent functioning of both arms, only as a means for the higher purpose of perfect tone-production. Only then will he succeed in rendering a musical composition in accordance with the author's intentions and in fulfilling his mission as an intercessor between creator and listener with complete success.

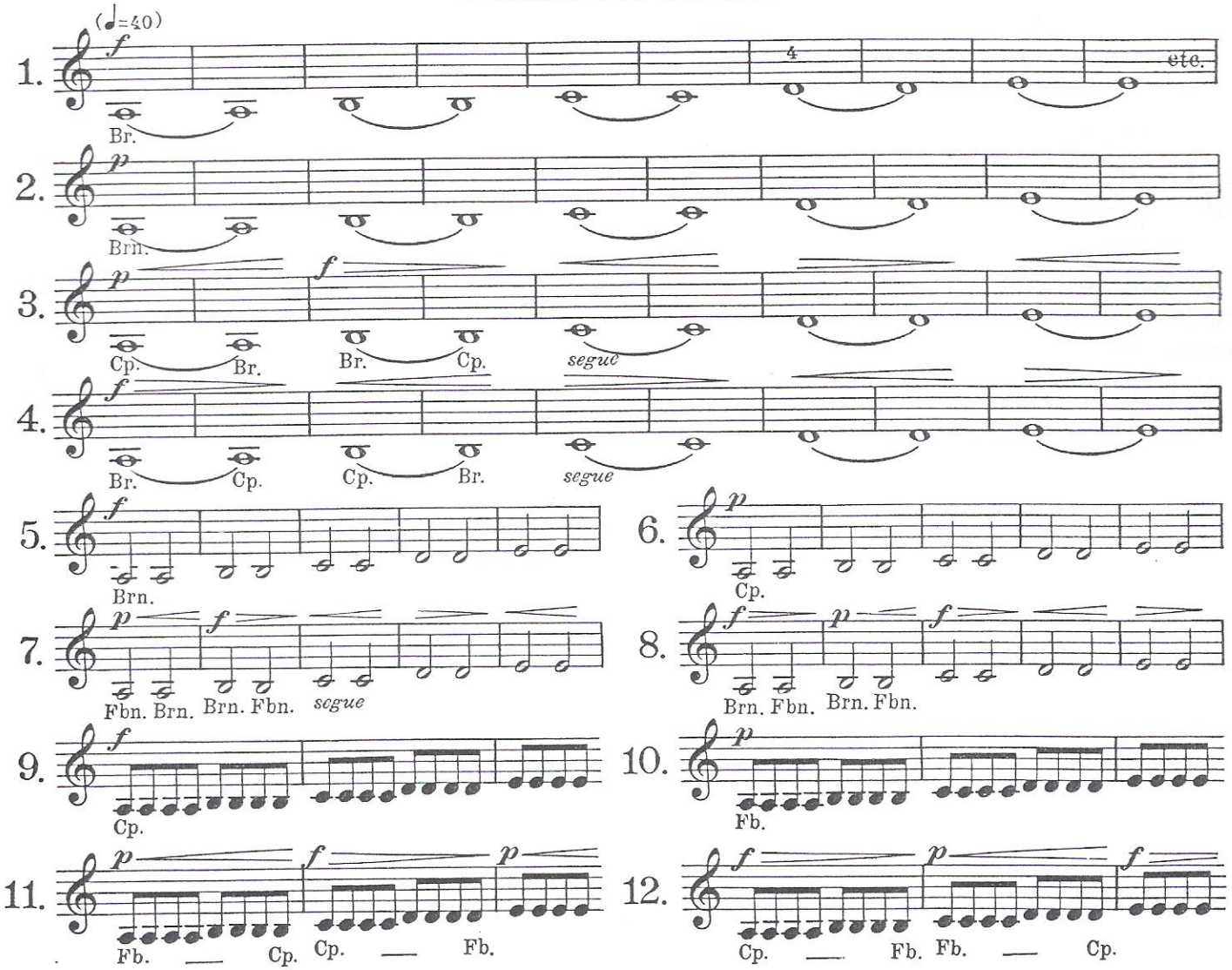
APPENDIX

STUDIES FOR TONE-PRODUCTION

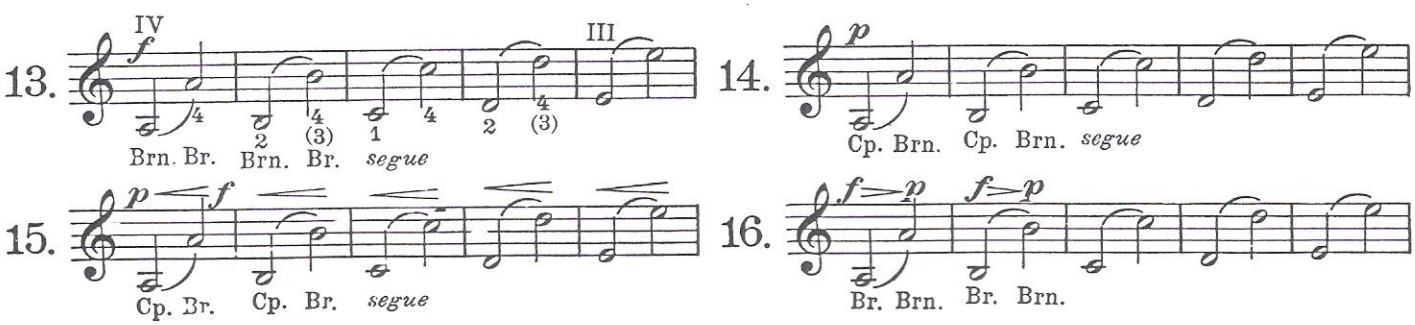
Explanation of Abbreviations.

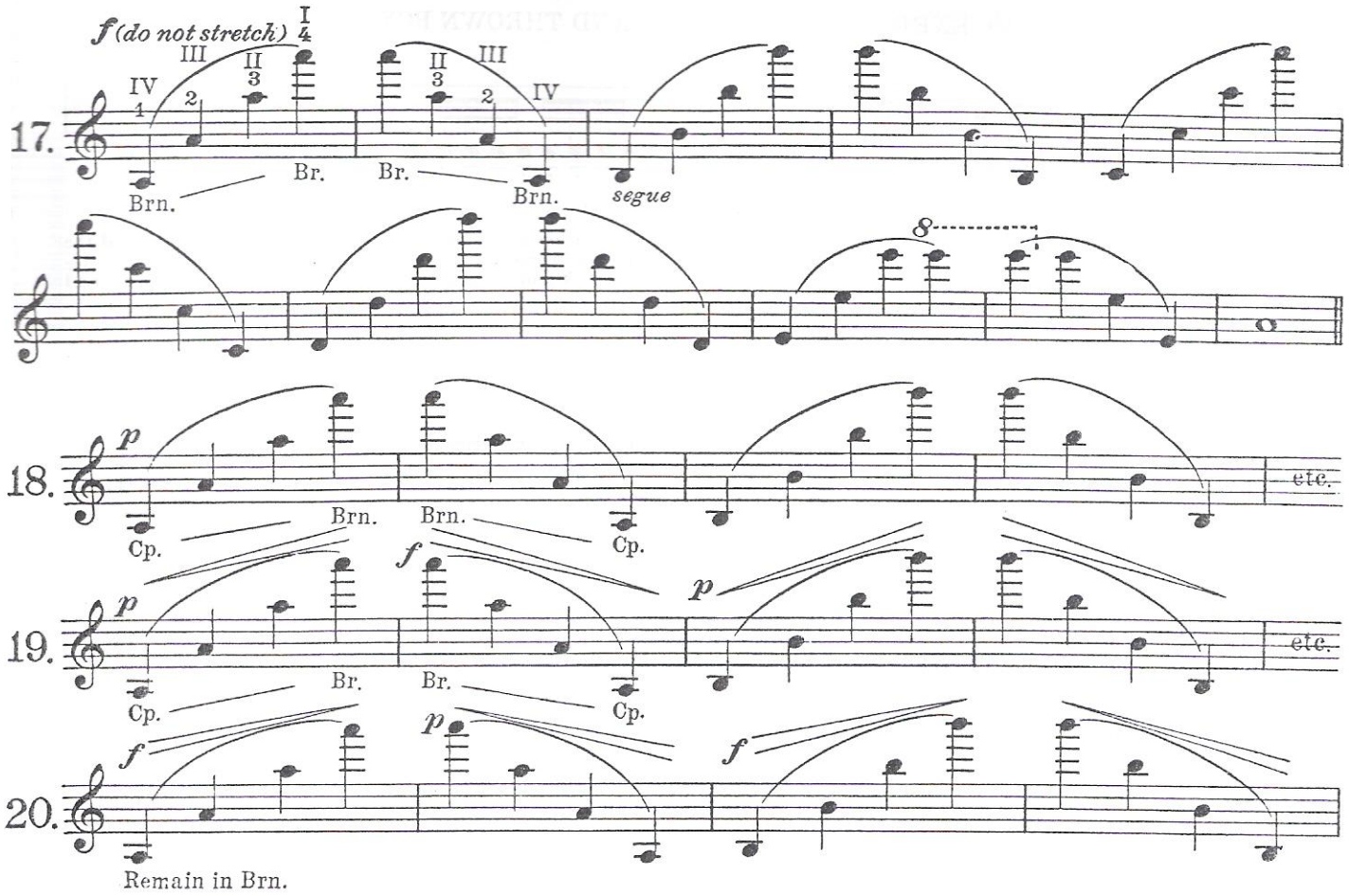
Pc. — Point of Contact.
Br. — at the Bridge.
Brn. — Neighborhood of Bridge, that is between Bridge and central point.
Cp. — at the central point.
Fb. — at the Fingerboard.
Fbn. — Neighborhood of Fingerboard; that is between Fingerboard and central point.
L.H. — Lower half of bow.
U.H. Upper half of bow.
W.B. —Whole length of bow.

I. WHOLE BOW STROKES



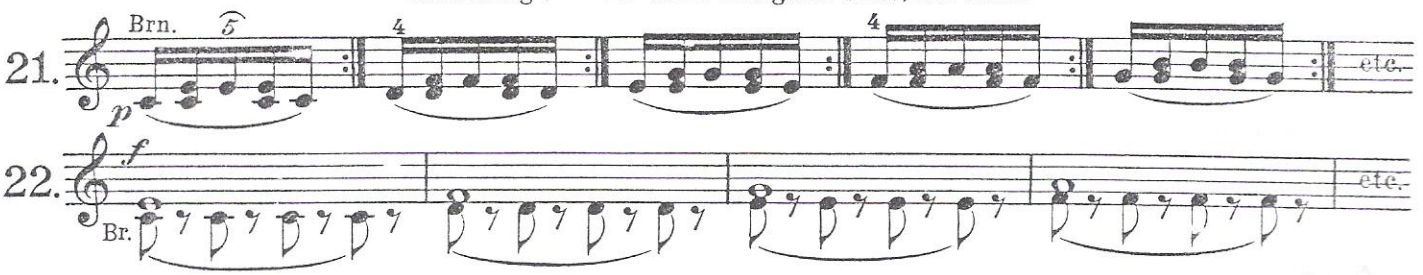
II. CHANGE OF POSITION





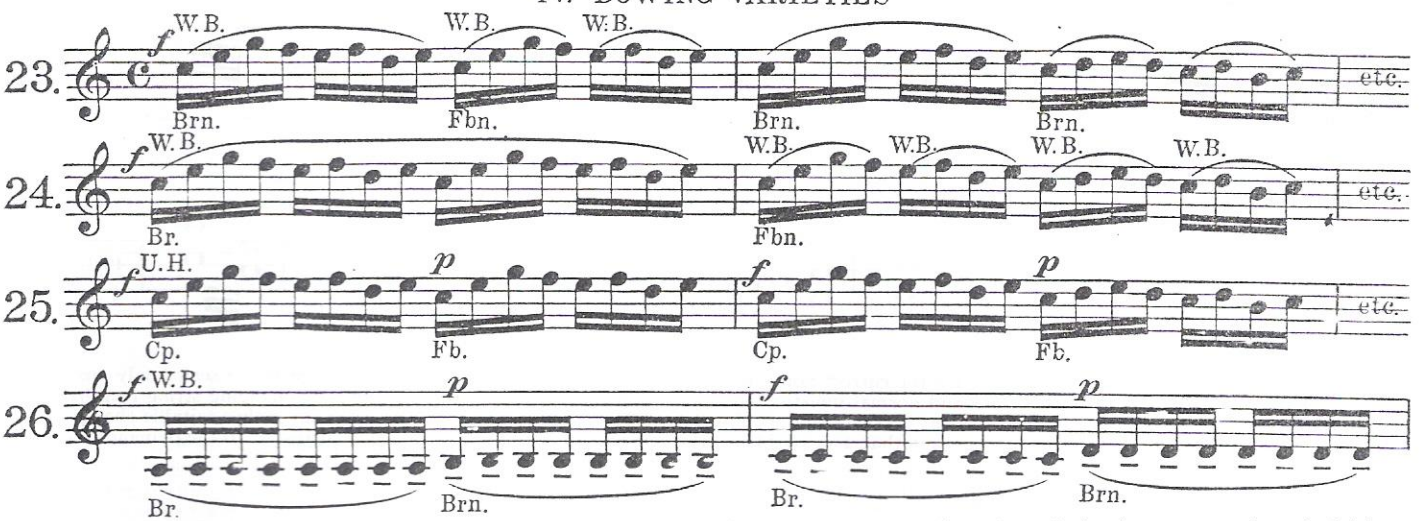
III. CHANGE OF STRING

Undulating (∿∿∿) instead of angular (⋀⋀⋀) movement



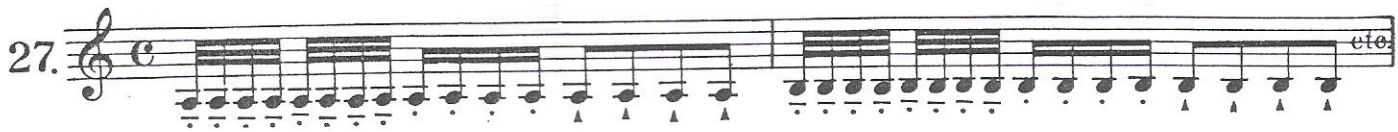
N.B. There is particular danger of pressure upon too soft or rather too yielding a section of the string, in the above shown intermittent change of strings.

IV. BOWING VARIETIES



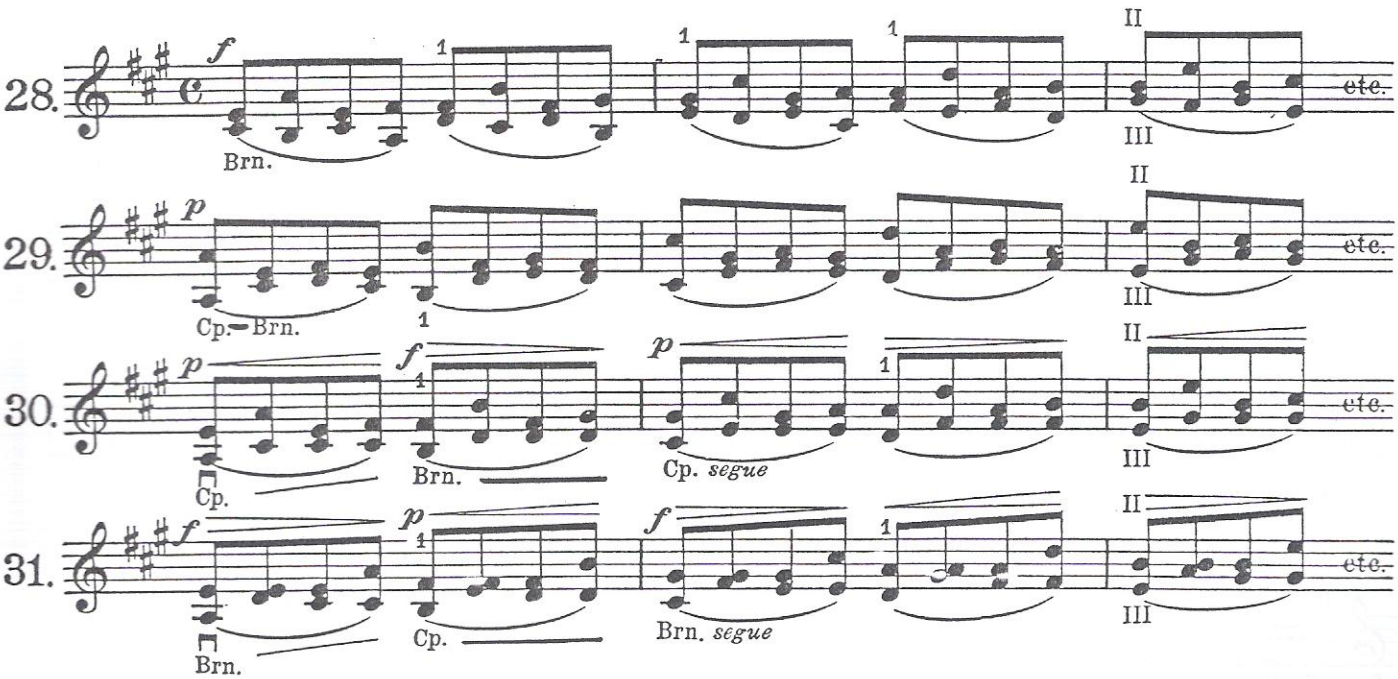
N.B. The constantly interrupted pressure movement, peculiar to the portato stroke, also calls for closer approach to the bridge during *piano* than with uninterrupted spun tones.

IVa EXERCISE FOR SPRING- AND THROWN BOW

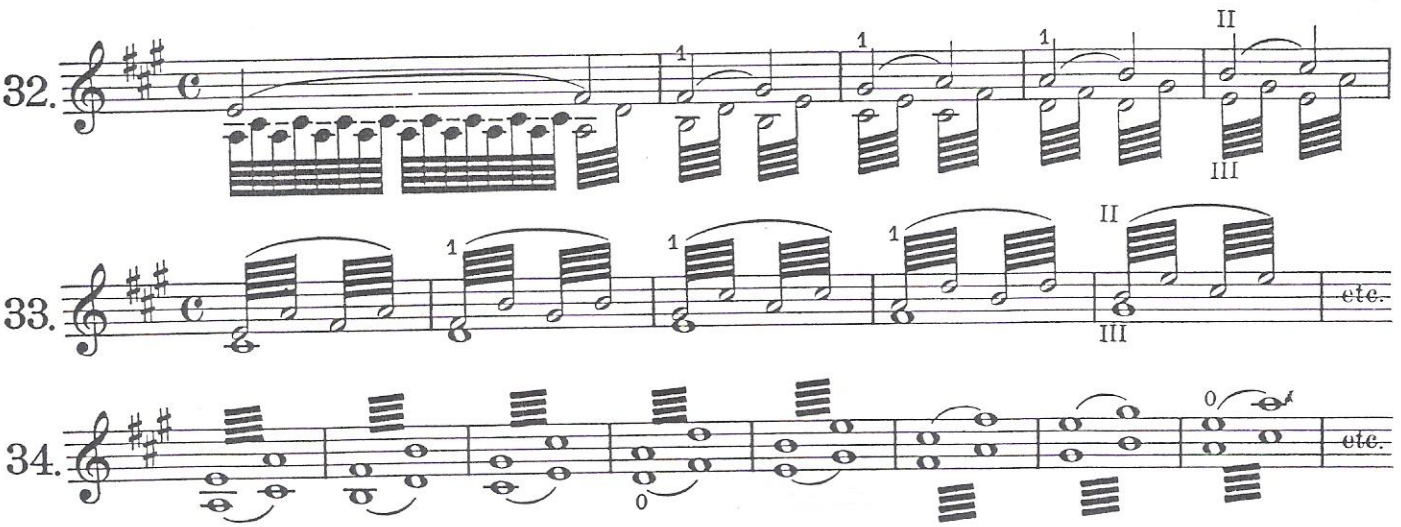


N.B. In this bowing variety, made up of a combination of rapid bows and quicker and slower thrown bows, it is not easy to find the correct point of contact, because the comparatively violent relapse of the bow upon the string while playing the sixteenth and eighth notes, requires a gradual change of the point of contact in form of an approach to the bridge. Attention to be paid not to neglect the h o r i z o n t a l movement of the bow in favor of the vertical falling movement.

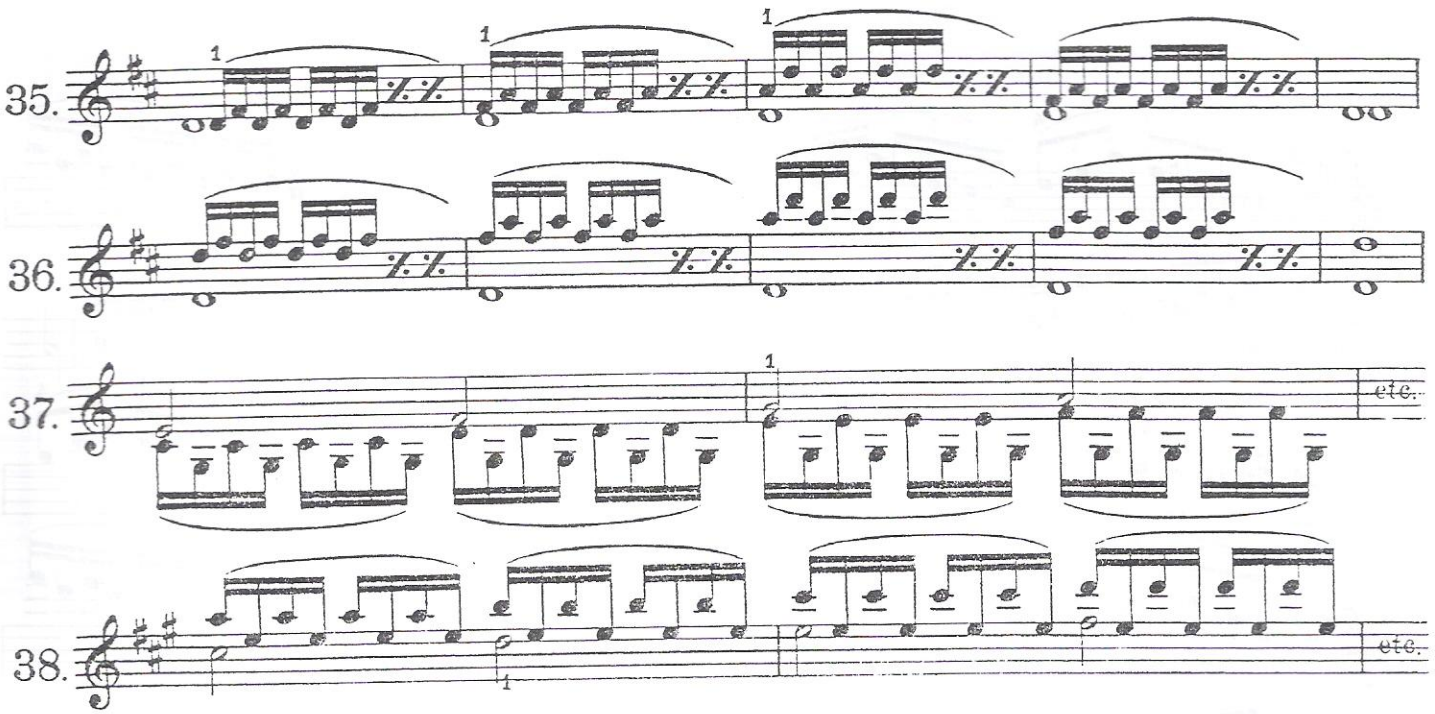
V. DOUBLE STOPS



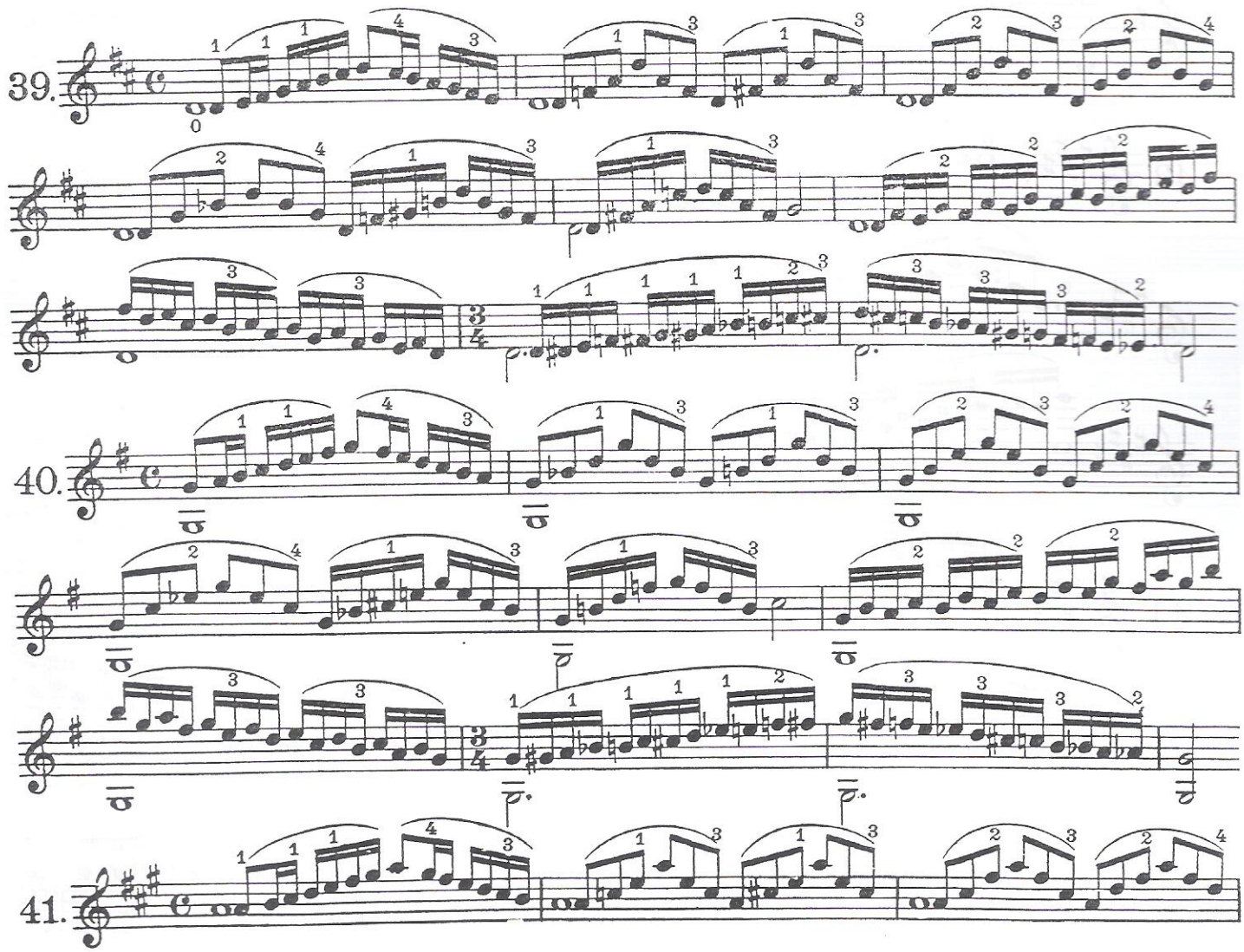
N.B. In numbers 28-31 the point of contact even during changeless dynamics requires shifting, because the string length is subject to continuous change. Here exact visual control is necessary.

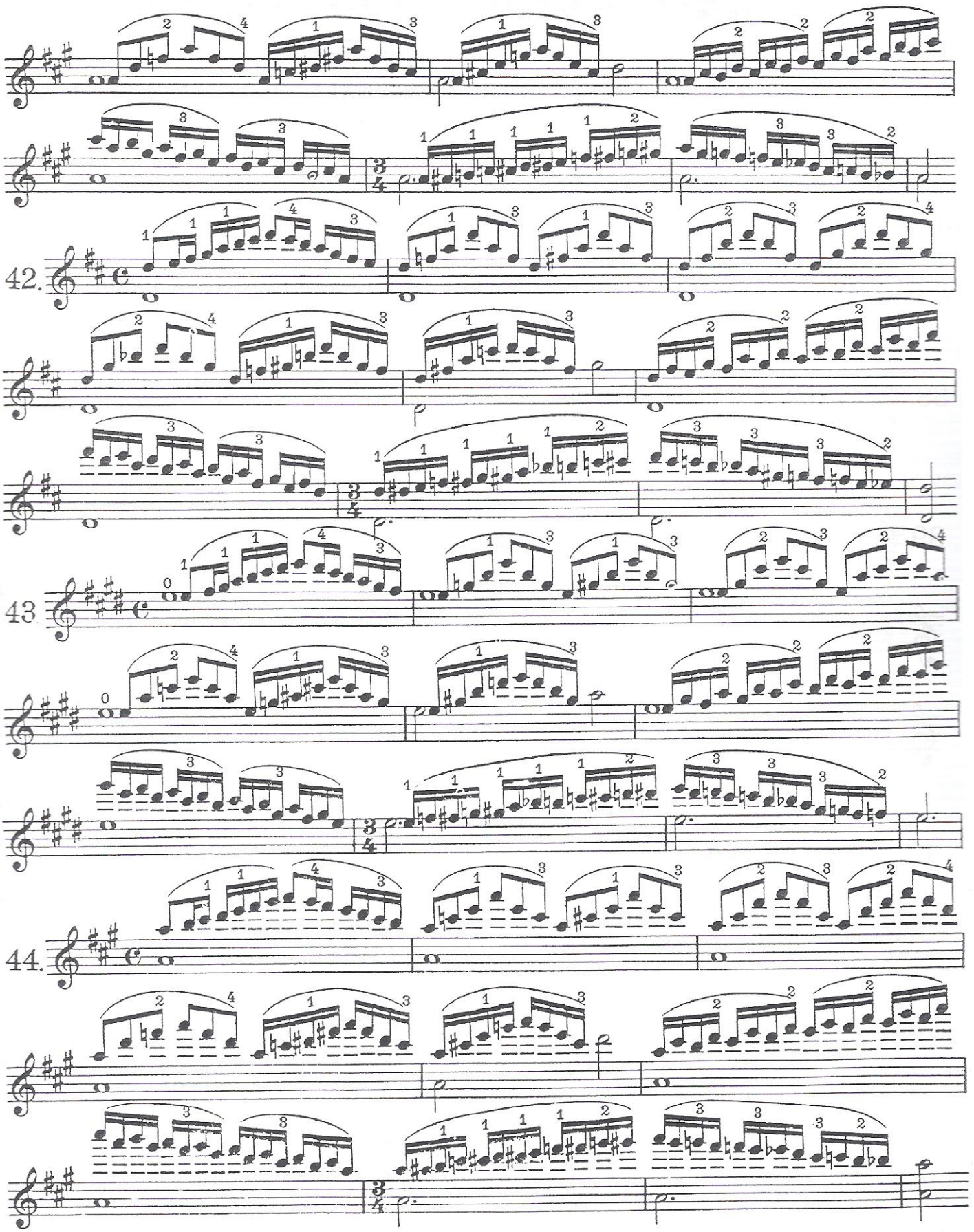


N.B. With double-stop tremolos the search for the correct point of contact develops into a problem, the solving of which seems only possible under favorable conditions as to temperature and normal moisture content of the air. Owing to the continuously changing string lengths with entirely different points of contact, the adjustment becomes so difficult because the rapidity of the tone progressions makes suitable change in the point of contact impossible. It is on this account that a m i d d l e course must be found which will do partial justice to the demands of both points of contact.



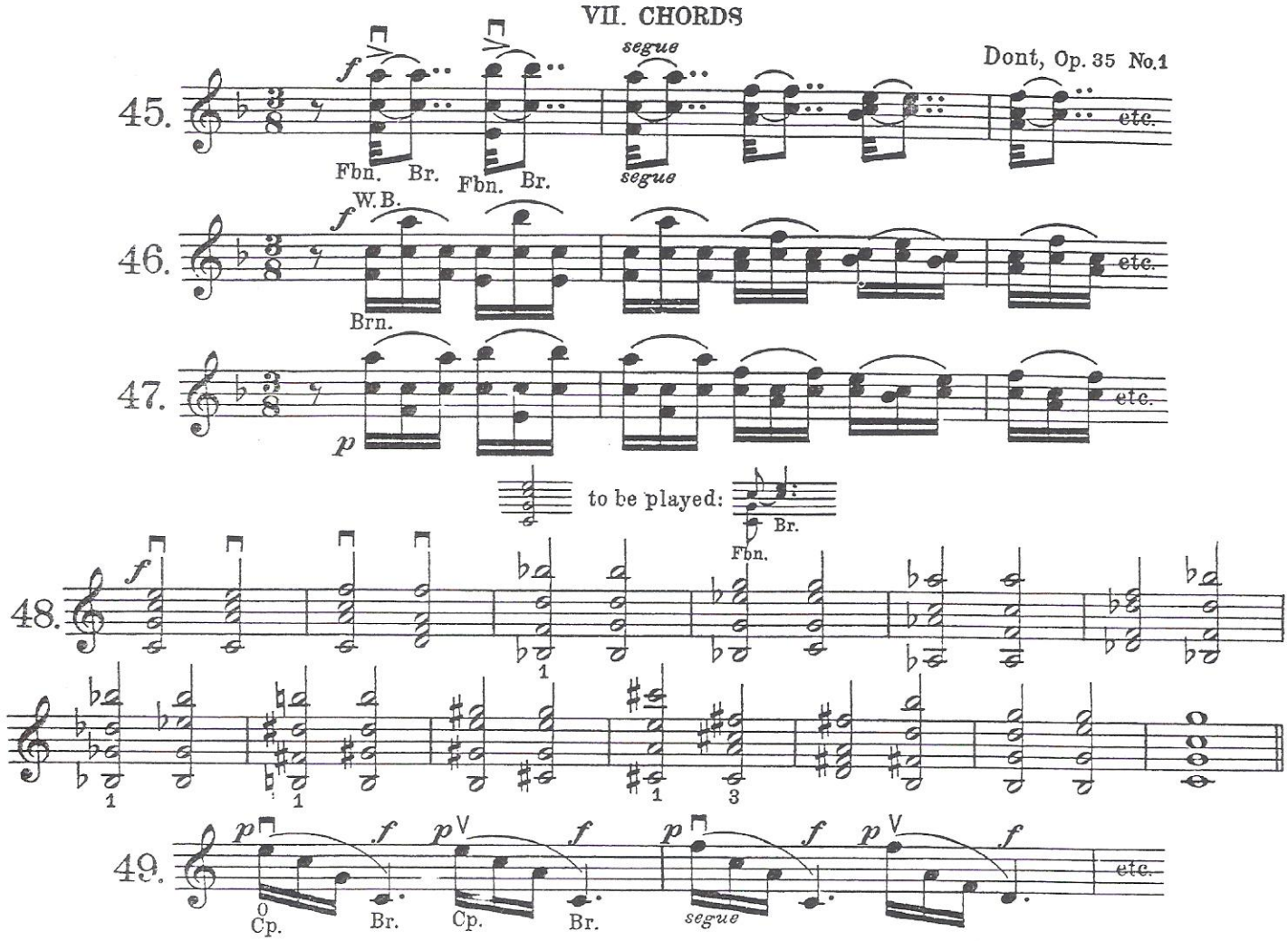
VI. HIGH POSITION STUDIES



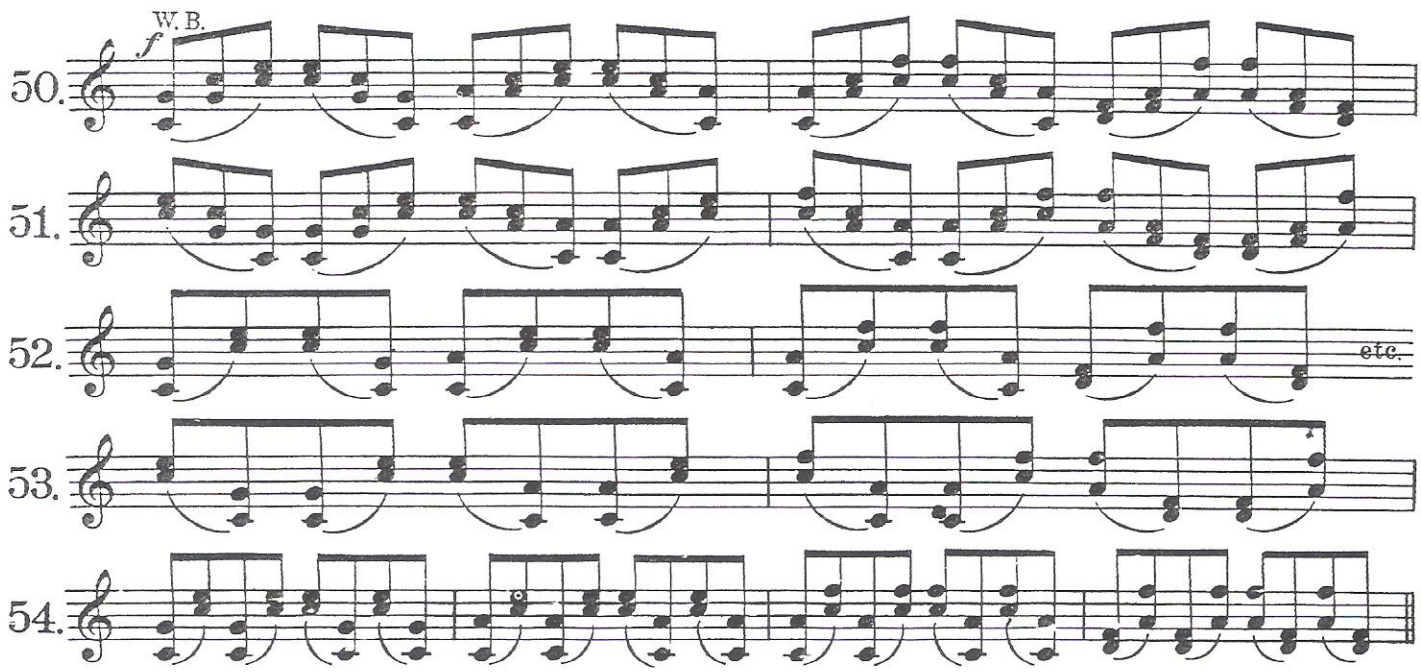


N.B. In the so-called Bag-pipe studies, no end of position differences are obtained, owing to the simultaneous vibration of the open strings. The adjustment as to point of contact suitable for both positions is exceedingly difficult to find. In any case the effective point of touch is influenced more by the higher positions than by the open string. Therefore, one should endeavor to approach the bridge as much as possible. I consider this combination as the most useful of all tonal studies.

VII. CHORDS



N.B. For musical reasons the reversed sounding of chords becomes a necessity if the thematic line is placed into the bass, as is so frequently the case in Bach's fugues for violin solo.



N.B. Owing to the additional problems of string transfers, four-voiced chords, divided into two pairs of double-stops, are difficult to realize in a tonally satisfactory manner. With them the point of contact needs constant watching. They belong to the most valuable of all tonal studies.

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JASCHA HEIFETZ

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