

elbows or the shoulders being elevated; the left wrist bent inwards, and the left arm near the body. If standing, the player should be well balanced on the legs, with the left foot advanced, and the weight of the body resting chiefly on the right hip. This position must be maintained without the least constraint. Above all, it is necessary to avoid making any movement of the body or the head, as many persons are apt to do in beating time. These directions, carefully followed, will promote a very graceful attitude, which will be not less pleasing to the eye than the tone of the instrument will be agreeably soothing to the ear.

“In order that all these rules may be observed, it will be well to place one's self before a mirror, a precaution that will be of great utility.”

CHAPTER XVIII.

ON SOUND-PRODUCTION, SIMPLE ARTICULATION, INTONATION, QUALITY OF TONE, ETC.

§723. THE PLACING OF THE FLUTE TO THE LIP.—726. THE MANAGEMENT OF THE LIPS AND THE LOWER JAW.—735. THE PRODUCTION OF SOUND.—737. THE USE AND THE ABUSE OF THE TONGUE IN ARTICULATION.—745. THE PRODUCTION OF THE NOTES FROM c' TO $c''\sharp$, INCLUSIVE.—751. THE PRODUCTION OF THE NOTES d'' AND $d''\sharp$.—752. THE PRODUCTION OF THE NOTES FROM e'' TO c''' , INCLUSIVE.—758. THE PRODUCTION OF THE NOTES $c'''\sharp$ AND d''' .—759. THE PRODUCTION OF THE NOTES ABOVE d''' .—762. INTONATION.—765. THE USE OF THE TUNING SLIDE.—767. ALTERED SEMITONES.—769. THE TONE OF THE FLUTE.—775. THE MANAGEMENT OF FLUTES OF VARIOUS MATERIALS.—778. INFLECTION OF TONE.—779. LEGATO PLAYING.—780. THE PLAYING OF OCTAVES.

723. The Placing of the Flute to the Lip. The head of the player being first placed as directed in the last chapter, let the flute be adjusted to the lower lip, *on no account lowering the head towards the flute*. It will be found convenient to place the flute, at its first contact with the lip, rather below its true position, in order that its final adjustment may be effected in an upward direction. After contact it may be raised sufficiently to cause the inner edge of the mouth-hole to rest against the edge of the red-part of the lip, supposing the mouth-hole to be of the proper size, and the lip to be of average thickness. Under certain circumstances this rule would, of course, require modification, but in any case a sufficient portion of the lip should be left free to protrude so that it may cover from one to three-quarters of the area of the mouth-hole, as may be required. Placing the flute too high would be likely to hinder this necessary protrusion, and to cause a dragging downwards of the lower lip, which might create a

fold or crease between the flute and the teeth. Such a fold would inevitably cause the lip to swell, and might be productive of much inconvenience and discomfort.

724. The exact height of the flute must be so regulated that the stream of breath, the air-reed, issuing from between the lips of the player may be conveniently directed against the outer edge of the mouth-hole, and it is of the utmost importance that the centre of this hole should be precisely opposite to the centre of the opening between the lips. The mouth-hole must be inclined towards the lips so that its outer edge shall be somewhat raised above the level of its inner edge, otherwise it will be found impossible to obtain a good tone without bowing the head.

Some difficulty may be experienced, at first, in adjusting the mouth-hole correctly to the lip. In course of time, the lower lip becomes so sensible to the touch of the flute that the adjustment becomes a mere matter of instinct, but before that result is attained it may be found convenient to feel the outer edge of the mouth-hole lightly with the upper lip. A good master can, of course, guide his pupil rightly, but a looking-glass will be of little service in showing how much of the mouth-hole is covered or uncovered. Some players adopt the objectionable plan of putting out the tongue to feel for the mouth-hole, actually licking the flute. It should scarcely be necessary to warn anyone against this offensive and odious custom, which is, however, not by any means uncommon.

725. Only a moderate amount of pressure of the flute against the lip is necessary. This pressure should be exercised in a slightly upward direction, and should be no more than just sufficient to give the instrument a firm basis on which to rest. Violent pressure would cause swelling and soreness of the lip, even if the flute were judiciously placed. Permanent swelling of the joint of the first finger of the left hand, attended with considerable pain, is also a not uncommon result of excessive pressure.

726. The Management of the Lips and the Lower Jaw. The theory of sound-production in the flute has been explained in chapter III, §§84 to 112. We have now to regard the subject from a practical point of view, and to consider the means by which to obtain a tone possessing every desirable quality, and free from any objectionable admixture of extraneous sound.

If the front teeth be even and of moderate length, the lower incisors falling naturally behind those of the upper jaw; if the lips be of average thickness, and endowed with strength, flexibility, and smoothness of surface; if, also, the chest be capacious, Nature may be considered to have conferred every physical requisite for the production of perfect tone. By perseverance, however, the ill effects of most of the common impediments may generally be, to a great extent, surmounted. The least inconvenient of these are abnormal receding of the lower jaw, and excessive thickness of the lips: the most serious are the projection of the lower beyond the upper teeth; weakness, thinness, or insurmountable roughness of the lips, and, worse than all, shortness of the upper lip combined with excessive length of the teeth.

727. The receding lower jaw may be rectified by pushing it forward, placing the front teeth edge to edge so that a strip of paper can be held between them. A little practice will render it easy to hold them in this position, which may afterwards be modified according to circumstances. The thick lips may generally be made thin enough to answer every practical purpose by stretching them very tightly across the teeth. Persons with thick lips generally find it easy to produce a powerful tone. The possessor of an "under-hung" jaw may sometimes succeed in drawing it back sufficiently to prevent its causing serious inconvenience, or he may so bring forward his upper lip as to obviate the ill effects of the prominence of the lower teeth. Weakness of the lips may generally be entirely overcome by diligent practice. A person with very thin lips will hardly succeed in producing a powerful tone, but he will possess a great advantage over those with redundancy of lip in the facility with

which he will acquire delicacy and softness. Roughness of the lips is seldom incurable; the frequent application of cold-cream, or some other appropriate unguent, will generally remove it, and its recurrence may be to a great extent prevented by cultivating the habit of keeping the mouth closed, breathing only through the nostrils. If the roughness cannot be cured, it may be regarded as an almost insuperable obstacle to flute-playing, and the same may be said of the unfortunate combination of a very short upper lip with very long teeth.

728. It is obvious that the first step towards the production of fine tone must be to make the instrument "speak." This may be readily effected, in a rough kind of way, by placing the flute to the lips, as indicated above, and blowing against the outer edge of the mouth-hole, but as the quality and the command of the tone will depend on the direction, the shape, the size and the force of the air-reed, it will be well to study the action of the lips, and the formation of the aperture between them, before a looking-glass and unfettered by the contact of the flute.

729. It is desirable that the aperture should be in the middle of the lips if their configuration, and that of the teeth, admit of its being in such a position, but this is not a very important point, and the advantage of a perfectly central opening lies chiefly in its appearance. Some writers on this subject have, as I think, attached undue weight to it: on the other hand, Quantz gives his opinion as follows: "He who has very thick lips will do well to make the opening towards the left side of the mouth instead of exactly in the middle." Two of the best English players of the last generation, both pupils of Charles Nicholson, formed the aperture towards the side of the mouth. One of them, Joseph Richardson, formed it to the left of the centre; the other, Samuel Thornton Saynor, to the right. The last-mentioned was celebrated for the power and brilliancy of his tone.

730. Amongst many good reasons for making the opening on one side or the other, may be mentioned the following: (I) The

presence of any irregularity of surface in the middle of either lip. (II) The presence of a projecting incisor in the lower jaw, which would cause pain or inconvenience if the flute were caused to press the lip against it. (III) The absence of perfect correspondence in the position of the upper and lower incisors, preventing the central divisions of the teeth from being vertical to each other when the teeth are placed edge to edge. In such a case it will generally be found convenient to allow the centre of the opening in the lips to be as near as may be to the central division of the lower teeth. Those who are able to do so, should always make the opening exactly in the middle of the lips, but those who cannot, should make it as near to the middle as possible. The orifice should resemble a barley-corn in shape.

The arcs formed by the edge of the uncovered portion of the mouth-hole, and the upper edge of the labial orifice, should be nearly concentric, and the cusps of the orifice should be in a line parallel to the flute. False intonation and impure tone would be the almost inevitable consequences of neglecting this rule.

731. In order that the breath may be properly directed, the upper and lower rows of incisors must be nearly opposite to each other; the lips, if kept close to the teeth, will then be level, or nearly so. If sufficient pressure be exercised at the sides of the mouth, on the wind being gently forced between the lips, the opening through which it passes will naturally assume the desirable fusiform shape. The aperture may at first be allowed to have an exterior length of about half an inch, and by carefully avoiding any turning inwards of the lips, it may be made to form a tube, of considerable length, extending from the teeth to the outer orifice. By increasing the strength of the wind-current and the pressure of the lips against each other, still avoiding turning them inwards, the opening may be gradually reduced without being materially altered in shape. The upper lip should then be stretched across the teeth, as in the act of smiling, the blowing being continued. The stretching of the lip must be regulated according to its thickness and to certain

other matters hereafter explained, but it should generally be moderate.

732. No precise rules can be laid down for regulating the distance between the upper and the lower teeth, as so much will depend on their length and on the thickness of the lips. It may, however, be stated generally that the distance should be as little as circumstances will permit, in order that the surfaces of the lips may be brought into contact sufficiently to give the tubular opening adequate length from its interior to its exterior orifice; the breath will thus be prevented from spreading unduly before it reaches the edge of the mouth-hole.

The lips should always be everted during playing, not only that the air-reed may pass over the smooth, moist parts of the lips which are not generally exposed to the air, but especially because the requisite shape of the opening cannot be otherwise maintained. How far it may be desirable to evert the lips will depend on their general conformation and on their thickness.

733. Those parts of the lips over which the wind has to pass must be kept moist, but not wet enough to cause the risk of any saliva passing out of the mouth with the breath. As a further precaution against this risk, the amount of saliva retained in the mouth while playing must be carefully regulated. In moistening the lips, the tongue need never protrude to the extent of a quarter of an inch; the less, indeed, the better.

734. The chin should be exercised by being slightly pushed forwards and drawn backwards. During the performance of these operations, the lips should be firmly pressed together and their surfaces caused to slide, one over the other, while breath is forced between them. By the alternate protrusion and retraction of the lower lip, caused by the action of the chin, the upper lip remaining almost stationary, the direction of the breath may be changed at the will of the operator.

The greatest care should be exercised to prevent the cheeks being puffed out by the wind forcing its way between them

and the teeth. They should be drawn in sufficiently to bring parts of them between the upper and lower back teeth, so that if the mouth were suddenly closed they would be bitten. The beginner will probably experience a slight pain in the muscles of the cheeks, which may be regarded as satisfactory proof that he is making conscientious use of them.

735. The Production of Sound. After the acquisition of some command of the lips and the chin, the flute may be placed to the mouth, in the manner indicated, while the upper and lower rows of incisors are opposite to each other. There should then be no difficulty in producing the note *b'* by blowing gently against the outer edge of the mouth-hole, but the tone will, no doubt, be at first of a hollow and generally displeasing character.

The lower lip being subjected to the pressure of the flute, its position will be thereby slightly altered while that of the upper lip will remain unchanged, the air-reed will therefore be deflected. If the chin be drawn back, so that this deflection may be gradually increased, a marked improvement will take place in the quality of the tone; the pitch will also be changed, becoming flatter than before. It will be found a useful and instructive exercise to draw the chin back gradually, and at the same time to turn the flute inwards, causing the sound ultimately to attain its limit in flatness; then, by reversing these processes, to cause the sound to attain its limit in the opposite direction, in neither case allowing a harmonic to take the place of the fundamental sound.

The exact mean, between the lowest and the highest pitches possible, is the true pitch of a well-tuned flute, and at this pitch only should it be played.

736. The outlines of the theory of intonation are given in the first part of this book, and the consideration of the details of this important subject, from a practical point of view, will be found in subsequent pages. It may be stated, in passing, that a flute will generally give the best quality of tone when sounded at its mean pitch, but the question of intonation may be set aside for

the present, and efforts may be made to improve the tone, regardless altogether of pitch, by: (I) Varying the tension of the lips. (II) Turning the mouth-hole inwards or outwards. (III) Raising or lowering the flute on the lip. (IV) Altering the deflection of the air-reed. (V) Increasing or diminishing the opening of the lips, by greater or less compression. (VI) Increasing or diminishing the force of the breath.

None of these alterations should be made at random, but the effect of every change of method should be carefully noted, otherwise a good sound might be produced by mere accident, and the student would probably be unable to ensure its repetition or even its continuance. Some guide as to the necessary force of the breath may be found in the fact that a practised flute-player, with lungs of fair capacity, should be capable of sounding the note *b'* uninterruptedly for thirty seconds. The subjects of respiration and the general management of the breath are fully treated in chapter XX.

737. The Use and the Abuse of the Tongue in Articulation. In the legitimate performance of the important office of articulation, sometimes called "tongueing," the tongue acts on the palate, after the manner of a valve, arresting or permitting the egress of the breath between the partially opened lips. The most perfect articulation is effected by the pronunciation, in a whisper, of the syllable *too*, but the French syllable *te* may be substituted. In either case, what is termed a palatal *t* should be used; a dental *t* induces a forward position of the tongue which prevents perfect clearness in attacking a note. In order to utter either of these syllables properly, inflate the lungs moderately; allow the lips to remain slightly open; apply the tongue closely to the roof of the mouth, well behind the gum; suddenly withdraw the tongue, permitting the escape of the wind from behind it, and the syllable *too*, or *te*, will be the result, according to the position in which the tongue may be allowed to remain.

738. In removing the tongue from the palate, be most careful

not to allow it to pass forwards towards the teeth; it is better to draw it slightly backwards, but one of the most important points to be observed in tongueing is to prevent the falling of the tongue to the floor of the mouth. In ordinary articulation, the tongue has but two positions; one pressed closely against the roof of the mouth; the other hanging loosely mid-way between the roof and the floor. One of the worst faults that the tongue of the flute-player can commit is to rest against the lower front teeth in such a way as to afford a false support to the lip. If the tip of the tongue were fixed against the teeth, articulation could only be effected by striking the hinder part against the palate, but a forcible attack on a low note would be impossible by such means, and instead of the clear, pointed beginning to the note, which might be obtained by pronouncing *too* with the tip of the tongue, an exceedingly unpleasant sound, something between a lisp and a hiss, would be caused.

739. The action of the tongue may be softened, and the beginning of a note rendered less acute, by using the syllable *doo* instead of *too*. Hotteterre (1669) used *tu* for ordinary tongueing, but Quantz (1752) used *di* as well as *ti* (pronounced, of course, *dee* and *tee*). There could be no possible objection to the use of either of these syllables, if properly pronounced, but I have found that with some persons Quantz's articulation leads to the habit of keeping the tongue dangerously low in the mouth, and it is generally safer to use the English *too* and *doo*; or the French *te* and *de*, any one of which syllables will certainly tend to keep the tongue away from the teeth.

740. Some beginners articulate in a strangely guttural manner, saying *turr* instead of *too*, and thereby acquire a habit of drawing back the chin in the act of tongueing, which tends to flatten the sound or to cause it to fail altogether. This bad habit may be overcome by practising, for a time, with the syllable *teew*. The English pronunciation of this compound word (really *tee-oo*) tends naturally to prevent the retraction of the chin.

The habit of pushing the chin unnecessarily forward in the act of tongueing, thus spoiling the tone and unduly raising

the pitch, may be overcome by practising with the French syllable *te*.

Those who are unaccustomed to analyse the mechanical processes by means of which articulation is performed, may not at once realise the necessity for partially opening the mouth before any syllable beginning with *t* or *d* can be uttered, but a little reflection and a few experiments, will demonstrate the impossibility of pronouncing either of these consonants without the previous separation of the lips.

741. An unfortunate custom of striking the tip of the tongue against the front teeth, instead of against the palate, appears to have originated in France. Devienne (1795) mentions this dental articulation as the method in ordinary use. He says: "It is necessary to take care that the tongue shall strike the teeth in pronouncing the syllable *tu*." He, however, also recommends the use of the articulation which I have ventured to call the legitimate one. This he describes as "another stroke of the tongue which has a great effect . . . and which may be employed in passages of great rapidity. It is performed by striking the tongue against the palate." In the great work of Hugot and Wunderlich (1801) precisely the same methods are recommended. Berbiguier (1820 *circa*) and Drouet (1827) were strongly opposed to touching the teeth with the tongue, and the same view has been held, as far as I am aware, by all English writers on the subject, including Wragg (1790 *circa* and 1806), Gunn (1793), Nicholson, 1820 *circa* (and 1836), Lindsay (1828), Carte (1845) and Clinton (1846). Tulou (1835) advocated "placing the tongue to the opening of the lips, without allowing it to pass outside them." This custom still prevails in France.

742. The actual protrusion of the tongue, in the act of articulation, for any appreciable distance beyond the lips, has never, to my knowledge, been proposed by any French *flûtiste*, and anyone indulging in such an offensive practice would certainly be dubbed in France a *flûteur*. It was reserved for some English players of the present generation to perpetrate the offence of protruding the tongue in articulation. This, in its mildest form

is a lisp, but it is sometimes carried to such an extent as to amount to actual spitting. Happily this most reprehensible habit is rare, and it is strongly condemned by public opinion.

743. Articulation by means of the lips, using the syllable *po*, is only adopted by the untaught, and the same may be said of beginning to sound the flute by *puffing* out the wind without any articulation. It will be understood that I am not now alluding to the slurring of notes together, an operation which demands the complete absence of any kind of interruption to the continued flow of the breath, and concerning which further information will be found in the course of this and subsequent chapters.

Much also remains to be said on the subject of articulation which may be conveniently deferred, but before proceeding to the discussion of other matters it may be well to consider certain methods of causing a cessation of sound.

744. The most simple means of effecting this object is the reversal of the ordinary process of tonguing, that is, applying the tongue to the roof of the mouth, more or less suddenly and closely as occasion may require, pronouncing an incomplete final *t* or *d*. Thus the act of stopping one note may be made to prepare the way for the articulation of the next.

Another way of arresting sound is to cease blowing suddenly, pronouncing the syllable *tooh!* or an approximation to it, the initial consonant, of course, giving the beginning of the sound. This method does not give so neat or precise a termination to the note as that last described, but it has its uses.

A note may be caused to die out gradually by reducing the force of the breath and the size of the aperture of the lips, total extinction being effected by ceasing to blow and closing the mouth. Important precautions, hereafter described, must be exercised in subduing the strength of the tone.

745. The Production of the Notes from *c'* to *c''*, inclusive. When the note *b'* can be articulated clearly, and produced with a fairly good tone, *a'*, *g'*, *f'* and *e'* may be taken in succession. Each note must be attacked firmly with the tongue; repeated

many times, and held for some seconds at each repetition. Then the next lower one may be attempted. In descending the scale it will be found necessary to enlarge the labial aperture; to increase the force of the breath, and to tighten the upper lip by drawing it over the teeth, turning the corners of the mouth slightly upwards, as previously directed. For all the notes of the first octave the lower incisors should be kept somewhat behind those of the upper jaw, in order that the air-reed may be sufficiently deflected to produce a firm, resonant tone, free from any trace of dulness. Turning the outer edge of the mouth-hole towards the lips may at first seem to produce the same effect as drawing back the chin, but although there may be some resemblance in the results of these two movements, as regards quality of tone, it will soon be found that turning the mouth-hole inwards not only causes the tone to be thin, but also flattens the pitch below that just mean which it is so important to preserve.

746. It would be impossible to describe exactly the quality of tone that the student should strive to obtain. He should, if possible, hear frequently some good flute-players, and select one of them as a model for imitation. Most persevering persons will succeed, sooner or later, in producing the kind of tone that they admire. Failing the opportunity of hearing tone worthy of being set up as a standard, some guide to the best quality of tone producible from a good flute may be found by experiment. A moderate command of the muscles of the mouth having been attained, place the flute to the lip; turn the mouth-hole well outwards, then, with a loose upper lip and a large air-reed, produce softly the note *g'* with the dullest, or most hollow, tone possible. Such a sound will be nearly simple, that is, it will be almost free from the admixture of partials: see chapters V and VI. Slowly turn the flute inwards, at the same time tightening the upper lip; reducing the size of the air-reed, and increasing the force of the breath. If the experiment be carefully conducted, the sound of *g''*, the first partial, will gradually come into hearing, and the quality

of the tone will be proportionately improved. On further carrying out the directions last given, the *g''* will become more and more prominent, while the lower sound will by degrees become merged in the higher until it will at last be scarcely audible. The tone, at this time, will be almost destitute of volume, and, as a consequence, it will be hard and thin, but midway between the two extremes of dulness and hardness, will have been found the true brilliant tone of the flute. See §§229, *et seq.*

747. By reversing the process, the best tone may be recovered, and this should be practised unremittingly until it can be obtained with certainty. Some firmness of tone having been acquired on all the notes from *b'* to *e'* inclusive, the remaining notes of the first octave may be practised. On a good flute, in proper order, there should not be much difficulty in descending to *c'*, but should success not be achieved at first, the following hints on the probable causes of failure will be found useful.

748. If the desired note utterly fail to sound, only a rush of wind being audible, the failure may be attributable to: (I) The imperfect closing of one or more of the lower finger-holes. (II) The pursing up of the lips, causing the edges of the opening between them to become corrugated, and the stream of air to be consequently irregular in form. (III) The wind being directed towards the right or the left side of the mouth-hole, instead of straight across it. (IV) Insufficiency in the rapidity of the air-current. The last-mentioned fault is the least likely to happen, as beginners generally blow too violently.

749. If, instead of the desired fundamental, one of the harmonics should sound, this may be due to: (I) One or more of the upper finger-holes being imperfectly closed. (II) Excess of rapidity in the air-current. (III) Insufficiency in the size of the labial aperture. (IV) The mouth-hole being too much covered. The last-named fault may be caused by: (I) Turning the mouth-hole too much inwards. (II) Placing it too low on the lip. (III) Allowing the lower lip to project too far over it.

Other frequent causes of failure to produce the lower funda-

mental sounds, are the too backward position of the chin and the bagging forward of the upper lip. In either case the outer edge of the mouth-hole will be too close to the upper lip to allow the air-reed to attain the requisite size, for the production of low notes, before striking the edge of the mouth-hole.

750. On a properly constructed modern flute the c'' may be blown similarly to the b'' , but the $c''\sharp$, on account of its necessarily small hole (see §§360-4) and the shortness of the column of air employed, will require to be rather more tenderly treated; increased firmness of the upper lip may also be necessary. In forcing the tone on this note especial care will be required to prevent the pitch from rising.

The ordinary veiled c'' of the old flute is naturally too sharp, and, being also weak, therefore requires great care in its production. The upper lip should be kept as firm as possible, and the chin should be drawn back, so that the position of the air-reed may be almost vertical. The $c''\sharp$ of the old flute always requires sharpening.

751. The Production of the Notes d'' and $d''\sharp$. When fingered in the ordinary manner the notes d'' and $d''\sharp$ cannot be considered to form part of the first octave, or register, of the flute, inasmuch as they are harmonics of $d'\natural$ and $d'\sharp$, assisted by opening the $c''\sharp$ hole as a vent-hole. See §§149 *et seq.* Neither can they be considered to belong to the notes of the second register, because all these are played as unassisted harmonics. The d'' ; fingered as the assisted harmonic of d' , is more easily sounded than any other note of the flute, and, but for the skill required for the perfect closing of the holes, it might be advantageously selected for the student's initiatory practice. On a good flute the note, when thus fingered, should be blown similarly to the b' ; if blown in the same way as the notes of the second octave it will be too sharp. On the old flute the d'' is invariably too flat, and will therefore require the chin to be brought well forward. When this note is fingered as a fundamental, *ex. gr.* the "open d'' " of Mr. Carte's flutes, it will require even greater precautions than the $c''\sharp$.

A slight increase in the tension of the upper lip, and in the pressure of the lips against each other, will generally be required for the production of the $d''\sharp$, as on many flutes this note has a tendency to crack, particularly when blown softly.

752. The Production of the Notes e'' to c''' , inclusive. These notes being ordinarily played as harmonic octaves unassisted by vent-holes, and being therefore fingered in the same way as their respective fundamentals, their production must necessarily depend on the peculiar management of the breath. It has been shown in §§91-2 that the harmonics of the flute may be produced by simply increasing the strength of the air-reed. The necessary strength, or stiffness, of the reed may be obtained, as Sir John Herschel points out (see §§ 91-2), by blowing more strongly, but it is obvious that this method could not satisfy the requirements of musical art. Were there no other means of producing the harmonic sounds of the flute, all the upper notes of the instrument would be loud in direct proportion to their height, and all the lower notes would consequently be comparatively weak. Taking into consideration the inherently piercing quality of the sound of high notes generally, and the importance of this being counterbalanced by efficient power in the lower notes, the flute could scarcely be pronounced fit to rank amongst the instruments of music if its higher notes could only be produced by strength of blast.

753. Although the harmonics of the flute *may* be sounded by force, we are happily independent of this, and the necessary speed of the wind-current, or, in other words, the stiffness of the air-reed, can be obtained with the greatest facility by simply reducing the size of the labial opening. If greater pressure of the lips, against each other, be exercised, the tube formed between the lips will become longer, and therefore the air-current, being less inclined to spread, will retain its velocity for a greater distance. Other important advantages gained by pressing the lips together for the production of the harmonic sounds, are the condensation of the air-reed in its passage between them, which of course adds to its stiffness, and the

protrusion and eversion of the lips, which, by shortening the distance between their orifice and the edge of the mouth-hole, produce a further effect in preventing the spreading of the air-reed. It may be taken as a positive fact that, *cæteris paribus*, if the compression of the lips be gradually and continually increased during the sounding of any fundamental note, the harmonic octave of that note will supervene as an infallible consequence. It must be self-evident that in order to effect any great increase in the pressure of the lips against each other, it will be necessary to reduce the tension of the upper lip across the teeth.

754. An octave harmonic, obtained by the means indicated above, will be too flat, as compared with its fundamental, unless some precautions be adopted to prevent that result, and the flatness of the upper note will be inversely proportional to the strength of the air-current. It has been explained that the pitch of any note may be raised, without increasing the force of the breath, by: (I) Turning the mouth-hole outwards. (II) Elevating the head. (III) Pushing forward the chin, while keeping the upper lip close to the teeth.

The first of these methods would be improperly employed in tuning an octave harmonic, because it would cause the mouth-hole to be more uncovered for the higher than for the lower note, which would render the production of the harmonic difficult and uncertain on account of the increase in the length of the air-reed which would thereby be caused.

The second method would be as improper as the first, and its adoption would be followed by precisely similar results, turning the mouth from the flute amounting to the same thing as turning the flute from the mouth, except that the movement of the head has a more ungainly appearance.

The third method is the only justifiable means of producing the unassisted harmonics in tune, unless, for the sake of a particular effect, the higher note is required to be much louder than the lower one, in that case the increased strength of the breath is a sufficient corrective.

755. Each of the notes, from e'' to c''' inclusive, will require

a slightly different pressure of the lips, and a slightly different position of the chin. The pressure of the lips and the advancement of the chin must be directly proportional to the height of the note, and inversely proportional to the strength of the sound.

In tonguing the higher notes of the second octave softly, or even with moderate strength, it may be found convenient to allow the tongue to strike a part of the palate rather nearer to the teeth, and generally to occupy a more forward position in the mouth, than for the lower notes, but the most stringent precautions must be taken to prevent contact of the tongue with the teeth.

756. The principles of sound-production set forth in this chapter were advocated and explained, in more or less precise language, by Quantz (1752), Devienne (1795), Hugot and Wunderlich (1801), Drouet (1827) and many others, but of all the writers on this important subject, Quantz has been the most explicit. I have met with many players who have instinctively produced the notes of the second octave in the manner here indicated, without knowing that they did so, but I have never heard anyone play these notes softly and in tune by any other means, and I believe it to be simply impossible to do so.

757. In the preceding remarks, c''' has been considered only as a harmonic octave, but this note has many fingerings on the old flute, and almost every one of these requires a special method of blowing. Further information concerning these matters will be found in the next chapter.

758. The Production of the Notes c''' and d''' . The precautions necessary for preventing excessive sharpness of pitch in the notes c''' and d''' must be reversed in playing c''' and d''' , or these notes will be too flat. The c''' , when taken as a harmonic octave of the c'' , may be played perfectly in tune on a well-constructed flute, but as on modern instruments the c'' hole is always necessarily smaller than the others (see §§360-1), and as small holes give flatter harmonics than large

ones (see §346), the chin must be placed further forward for the c'''^{\sharp} than for any other note except the d''' , which generally requires similar treatment.

No rule can be given for the production of the c'''^{\sharp} of the old flute. The remarks on the c'''^{\natural} of this instrument, in the preceding section, are equally applicable to the c'''^{\sharp} .

759. The Production of the Notes above d'''^{\natural} . Almost all the high notes of the old flute have a tendency towards flatness; this tendency is much more strongly marked in some notes than in others, but as a general rule all the notes of this instrument, above d'''^{\natural} , require great compression of the lips, in order that they may sound, and considerable advancement of the chin, in order that they may not be too flat, in fact, *the notes are false unless corrected by the player*. On all the best modern flutes the chief precaution to be observed in producing these notes, is to avoid any further pushing out of the chin than for the corresponding notes of the second octave. Compression of the lips, in direct proportion to the height of the sound, will of course be absolutely necessary for their production, but *the notes require no correction in their intonation, as on these flutes they are true unless rendered false by the player*.

On flutes of modern construction with ill-placed holes, the remedy must be adapted to the circumstances. It will often be found necessary, on such instruments, to draw back the lower jaw, and at the same time to turn the flute inwards, in order to arrive at any approach to correctness of tune. See §§594, 668-9, 673 and 680.

760. The position of the tongue may be about as forward for the notes of the third octave as for those of the upper part of the second octave, and the tension of the upper lip must be relaxed as the pressure of the lips against each other is increased.

761. The remarks on the importance of economy in the expenditure of breath, for the production of the first series of harmonics, will apply also to the notes of the third octave. It is obvious that sufficient force of wind must be applied, in order

to obtain the desired power of sound, but the increase in the rapidity of the air-current, necessary for the actual production of the higher notes, should be obtained rather by vigorous action of the lips than of the lungs.

762. Intonation. The necessity for correct intonation, in all musical performance, is so self-evident that it would be unnecessary to draw attention to the importance of the subject, were it not for the unfortunate fact that many players, on both wind and stringed instruments, appear to consider perfection of tune as being simply a desirable consummation if attainable without too much trouble, or without the sacrifice of some comparatively unimportant accomplishment on which they particularly pride themselves, such as expression, tone or execution, and though perhaps few would be bold enough to give utterance to such sentiments in so many words, yet many, by their manner of playing, evince their real opinions clearly enough to justify these remarks. Now, without desiring, in the least, to underrate the value of any other point of excellence, I would urge that intonation is, to say the least, the most important point but one in the whole range of the art of music: it may even be considered to include the playing of correct notes, inasmuch as all musical sounds depend upon pitch for their identity.

763. A flute tuned on correct principles will be in tune only when blown at its mean pitch, the influence of the manner of blowing being inversely proportional to the distance of the note-hole from the mouth-hole. The mean pitch and the mean strength of tone being maintained, and the precepts given in the preceding sections of this chapter being followed, the happiest results may be easily obtained. If a player will insist on blowing sharper or flatter than the mean pitch, he must have an instrument made expressly to suit his vicious method. If he will blow too sharp, the flute must be made longer; the holes (contrary to an assertion of Boehm's) must be placed more closely together than would otherwise be necessary, and *vice versa*.

Good English flutes are generally, and always should be, made of such a length that when blown at the medium pitch,

and the slide is drawn out an eighth of an inch, they may give an *a'* with 452 vibrations. When the mean pitch of the instrument is known, it is an excellent plan to test the accuracy of the blowing by means of a tuning-fork of similar standard: see §300.

The method of preserving the intonation during those inflections of tone so necessary for musical expression will be presently indicated.

764. Flutes of evil construction, whether by reason of imperfect boring or ill-regulated positions of the finger-holes, must be compelled to come into tune, and the player must not hesitate to sacrifice everything else, if necessary, to gain that end. I am here assuming that, for no matter what reasons, a man is wedded, for the time being, to a particular instrument, and that this is a bad one. In that case let him consider true intonation as the one thing needful. It may be difficult to attain, but it will not be impossible, and perseverance, with careful attention to the foregoing directions, will help him to find the way to achieve his object. Let him therefore follow the advice of excellent Robert Herrick:

“Attempt the end, and never stand to doubt;
Nothing so hard but search will find it out.”

765. *The Use of the Tuning slide.* As no flute, without alteration of its length, can be advantageously played except at one particular pitch (see §§325 and 356), every flute-player should try to discover the good or the bad points in the tuning of his instrument.

It will be evident that the intonation of a well-made flute must be injured by elongation above the finger-holes, and also that if these be too far apart the tuning will, on the contrary, be improved by such a procedure. In §327 it is shown that the defects caused by altering the length of a correctly tuned flute, can be to some extent obviated by a judicious change in the manner of blowing; therefore, in flattening the pitch of such an instrument by means of the slide, care should be taken to draw this out sufficiently to compel the blowing to be sharper

than the mean pitch of the flute. The excess in the drawing out of the slide, and the consequent sharpness of the blowing, must be regulated by the amount of flattening required. It is almost impossible to play in tune on a properly made flute if its pitch be flattened more than a quarter of a tone.

The ameliorating influence of the position of the “cork” or “stopper” is described in §§328-332.

766. In tuning to another instrument, or to a tuning-fork, the flute should always be brought up to the temperature which it is likely to reach during playing. The readiest way of effecting this object is to finger *c'*, and, placing the mouth-hole between the lips, to breathe through the tube. Several notes such as *a'*, *d'*, *d''*, *a''*, *a'*, may then be sounded, so that their true bearings may be obtained, and finally a good, firm *a'* of medium strength may be given, and compared with that of the accompanying instrument. Should it be necessary to alter the pitch of the flute, let the slide be adjusted according to the above directions, carefully guarding against the slightest attempt to alter the pitch by the blowing. In order to avoid being tempted to fall into this error, it is always advisable to sound the flute before hearing the pitch of the instrument with which it is desired to bring it into accord.

The *a'* of the old-flute being a badly veiled and generally uncertain note, it is better, when practicable, to select *g'* as the tuning note. This gives a far more accurate idea of the average pitch of the instrument than *a'*. In order to find the bearings of the notes, it will be well to sound *g'*, *d'*, *d''*, *g''*, *g'*.

767. *Altered Semitones.* In §§271, *et seq.*, equal temperament has been shown to be indispensable, but there are certain cases in which a slight and temporary departure from this system may be permitted. These cases result in the lessening of a semitone, either by raising the lower, or depressing the upper, of the two notes which form the boundaries of the interval, thus causing some approach to the semitone of Pythagoras (see §§266-8). This reduction of the semitone, if not carried to an extreme, is generally as agreeable to the ear as the slightest

enlargement is offensive, but on no account must a note be raised or lowered when it forms an integral part of the accompanying harmony, or when it is near to a similar note which is not so altered from its normal pitch. The raised lower note of the semitone is known in France, where it is much used, as the "*note sensible*," or sensitive note. I know of no technical name for the depressed upper note of the interval. The following examples will serve to show where the alternation is permissible, and the contrary.

768. *Examples of altered Semitones.*

S shows the sharpened note, O the true note, F the flattened note.

769. The Tone of the Flute. No instrument is susceptible of so much variety in the quality of its tone as the flute, and for this reason it requires the greatest care and discretion in the production of its sound. One of the chief aims of every flute-player, should be the preservation of the natural charm of the instrument, and in this, as in so many other matters connected with music in general and the flute in particular, it is well to remember Apollo's advice to his son: "*In medio tutissimus ibis.*" The most perfectly lovely quality of tone that can be obtained from the flute is the exact mean between the hard, thin, penetrating tone, which, somewhat resembling that

of the hautboy, is almost nasal in its character, and the open, hollow sound which is similar to the cooing of a dove.

770. The hard, thin tone, which is obtained by covering too much of the mouth-hole; by over tension of the lips; by excessive protrusion of the upper lip; by insufficiency in the volume of the air-reed, and especially by the combination of all these faults, is greatly admired by many persons, and it certainly has the advantage of being brilliant, but it is not the true tone of the instrument; it is inflexible in the highest degree, and it is invariably attended by flatness of pitch. It will be remembered that the partials are always excessively prominent in the hard tone.

771. It follows, as a matter of course, that by uncovering too much of the mouth-hole; by undue relaxation of the lips; by excessive protrusion of the lower jaw; by the employment of too large an air-reed, and particularly by the combination of all these faults, the hollow tone will be obtained. This is far less objectionable than the hard tone, but it should only be employed for the sake of contrast, and never excepting in a *piano*. C. N. Weiss (1824 *circa*) attached much importance to the effect of these cooing sounds. He called them *sons creux*, in opposition to the *sons pleins* of the French. The latter expression should not be understood as indicating the hard, hautboy-like tone, but the full, round, brilliant quality that is truly characteristic of the flute. M. Terschak, in his well-known fantasia "*La Sirene*," gives the following direction for the employment of the hollow tone: "*On imite ici le son de la flûte d'amour.*"

772. It will hardly be necessary to repeat that by a judicious modification of the before-mentioned influences, the mean between extreme hardness and hollowness may be obtained. This is the true quality of flute-tone, which should combine, as occasion may require, power or softness; sufficiency of volume (as opposed to thinness); brilliancy (as opposed to dulness); sweetness (as opposed to harshness), and clearness (as opposed to impureness): See §§229 to 238.

773. The only qualities in the above list, which require further consideration, are clearness and its opposite, impureness. Clearness is one of the most essential qualities of flute-tone, but it is unfortunately the point in which players are most prone to err. It can only be obtained by eliminating, as far as possible, the sound of the breath, and this must be effected by scrupulously avoiding the least waste. All the breath that passes the lips should be employed in making tone; all that is allowed to pass without being so utilized, not only distresses the player unnecessarily, but tends to cause that intolerable hissing sound which is so prevalent amongst players on the flute, and which gives occasion for one of the greatest and most frequently deserved reproaches that are urged against the instrument.

Another objectionable sound, often made in flute-playing, is an involuntary guttural exercise of the voice, in fact a grunt. The habit of uttering this sound may be easily overcome by a little perseverance.

774. The presence of the partials, in a certain degree, has been shown to contribute to the excellence of tone. They are, of course, far less prominent in the second octave of the flute than in the first; the third octave is almost free from them, but the notes of this octave are exceedingly liable to the always detrimental influence of the lower attendants (see §§192-3 and 228); it should therefore be the constant effort of the player to prevent, as far as can be prevented, the occurrence of these objectionable sounds, which, perhaps more than any other cause, tend to destroy the clearness of the upper notes.

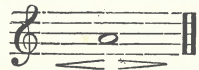
775. *The Management of Flutes of various Materials.* The relative excellence of the different materials of which flutes are constructed is discussed in §§311 to 321, and my preference for ebonite, with the reasons for that preference, are duly recorded therein. A few words of advice as to the manner of avoiding the besetting faults of wood and metal, will be useful to those who have flutes of either of these substances, and to whom it would be inconvenient or distasteful to change their instruments.

776. The chief fault attributable to a modern flute of wood is coarseness of tone. The best means of counteracting this fault is to use as little wind as possible, therefore the lips should be sufficiently compressed to keep the air-reed small, and the blowing should be as gentle as may be. The tendency to hardness, which might be induced by the compression of the lips, may be overcome to some extent, by keeping the upper lip well away from the outer edge of the mouth-hole.

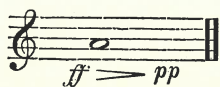
777. The chief fault attributable to flutes of metal is shrillness of tone. This may be counteracted, in a certain degree, by the employment of a large air-reed, and by abstaining from too much tension or compression of the lips. Although little force of wind is necessary for the actual production of sound from a metal flute, yet a far greater quantity of breath must be expended in obtaining a certain strength of tone from such an instrument than from a similar one of different material, unless objection to shrillness be altogether waived. Those who have acquired, and are unable to discard, the peculiar method of blowing that is best adapted for a metal flute, may be expected to prefer such an instrument, but it by no means follows, as some would wish us to believe, that such a method and such a flute are the best, however well they may be adapted one to the other.

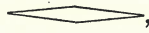
778. *Inflection of Tone.* Without modification of tone, musical expression would be well-nigh impossible. The acquisition of perfect command of the *forte* and the *piano*, with all the subtle gradations between them, is therefore one of the most important requirements of the art of flute-playing, the *chiaroscuro*, in fact, of music. It is not difficult to obtain loud or soft notes on the flute, but it is difficult to preserve perfect intonation while doing so, and it is still more difficult to maintain a good quality of tone while increasing or diminishing its strength. Constant practice will alone give facility in the exercise of this indispensable accomplishment, and the best kind of practice is sustaining long notes with every possible variety of inflection. Tulou (1835 *circa*) has shown the danger to the beginner, of practising the

usual exercise: viz.,
tioned a certain fail-
persons, namely par-



the gradual rising of pitch during increase of power. Few ears are insensible to flatness, therefore it is advisable to begin by practising all the notes of the chromatic scale (starting from some easy note, and working, in regular succession, alternately upwards and downwards, from that note) in the manner thus indicated:



Especial care should be exercised to prevent any alteration of quality of tone: either of pitch or of quality of tone: uniformity in these respects can only be attained by gradually compressing the lips and turning the flute outwards as the strength of the tone is reduced. In the notes of the second octave the chin should be at the same time protruded, but this action is likely to cause a change of quality if applied to the notes of the lowest octave. Some command of the *diminuendo* having been obtained, the swell , may be practised, the methods adopted for maintaining uniformity of pitch and quality in the *diminuendo* being, of course, reversed in the *crescendo*. It will be found of great assistance in learning to preserve the pitch, especially in the *crescendo*, if appropriate chords are struck on the pianoforte during practice. Should the student be unable to obtain this help, he may use a harmonium, placing weights on the keys, and blowing the bellows for himself. In the absence of both these aids, let him trust to his ear alone, and in any case let him seize every opportunity of educating that organ to the last degree of sensibility and refinement.

779. Legato playing, that is, passing smoothly from one note to another, may sometimes be effected simply by changing the fingering, but many intervals require considerable modification in the blowing, in order to prevent any break in the tone. Particular directions for the slurring of the different intervals will not be necessary, it will suffice to say that the position, tension and compression of the lips must be rigorously adapted to the

but he has not men-
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requirements of the notes, and that all the necessary changes must be made simultaneously with the movement of the fingers. As every note must be either articulated with the tongue or slurred to the preceding note, it follows that the first note of every *legato* passage must be tongued.

780. Passages of slurred Octaves are both effective as music and useful as practice. They are most pleasing when played as at No. I in the following example:



but it is sometimes necessary to play them as at No. II or No. III. The first method can only be perfectly carried out when both notes of the octave are fingered alike. The manner of regulating the action of the lips will readily suggest itself. When octaves are played as an exercise, frequent recourse to the looking-glass during practice is almost indispensable, excepting in the case of an experienced player. See §§752 to 761.