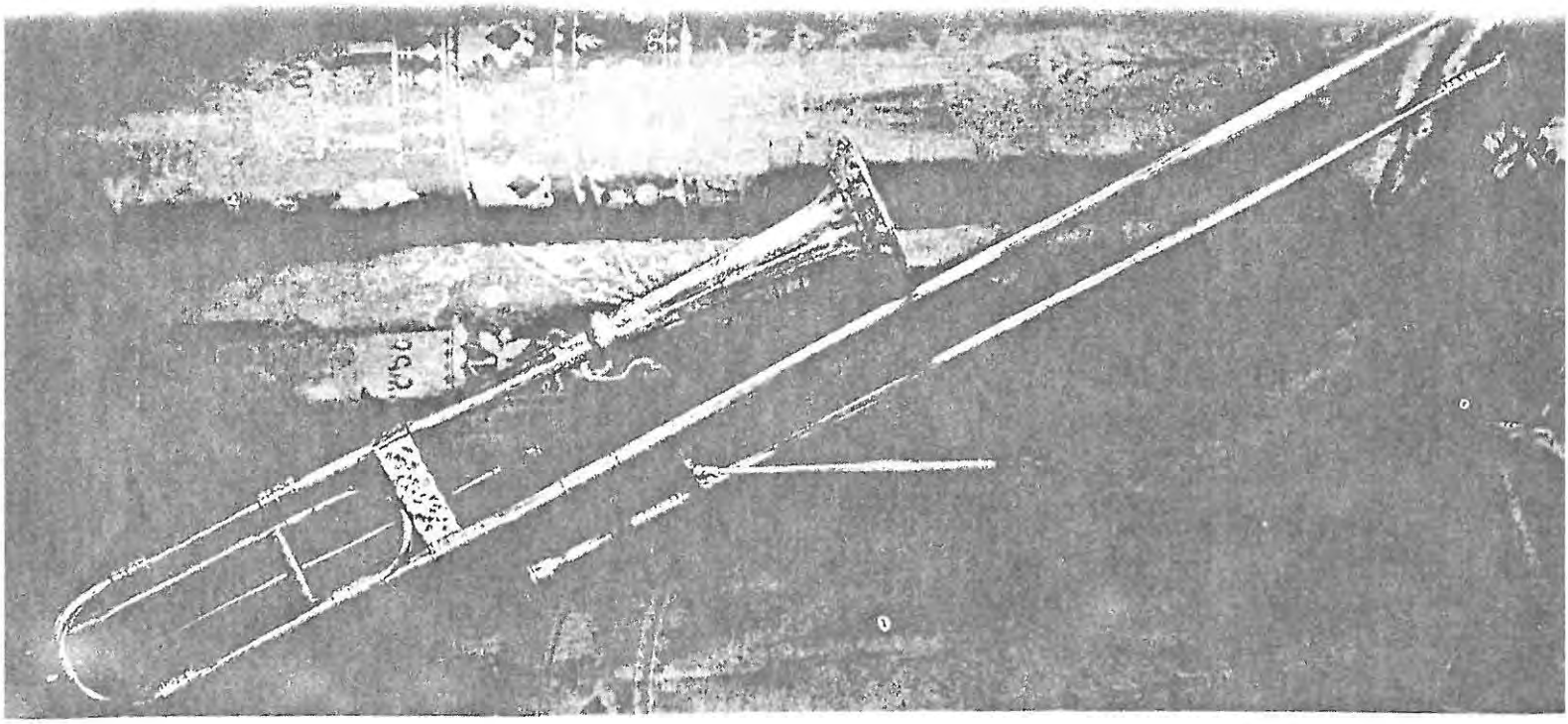

THE PLAYING CHARACTERISTICS OF AMERICAN TROMBONES AND GERMAN-SYSTEM BASSOONS

A THESIS

SUBMITTED TO

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C O N T E N T S

P R E F A C E

SOUTH AFRICA, a country renowned for its mineral wealth has, perhaps paradoxically, no musical wind instrument manufacturing industry of its own as yet. Thus performers, educators and students alike have either to travel to Europe or America to select an instrument, or to import an expensive instrument that may be both unseen and untried, as very few musical instrument dealers are prepared to outlay capital on stock which appeals to a decided minority of their potential customers. Alternately, a purchase of a particular make or model can be made on the basis of a hearsay opinion; at best, the opportunity for first-hand assessment is minimal.

It is the trombone of U.S.A. manufacture and the German bassoon which represent the current state of their respective manufacturing arts, and the yardsticks by which their many imitator's efforts are measured. One of the main aims of this Thesis is to describe in **objective** terms what has been experienced **subjectively** over the years of involvement with these instruments -- arguably a task similar to that of the art critic, but operating within more positively defined parameters namely, what **works** for the student and professional, and what doesn't.

The candidate claims credit for introducing the large-bore Bb/F trombone to South Africa in 1961, following with the introduction of the first double-valve bass trombone in 1965, and the first such instrument with in-line rotors in 1979. The first of the new 5000 series larger-bore Schreiber bassoons was likewise introduced in 1981.

The advantages and pitfalls of "doubling" between the **trombone** and other wind instruments, and between the **bassoon** and other winds, are discussed at length in the final section of the Thesis.

Newcastle, December 1985

TROMBONES

CHAPTER I : BACKGROUND AND TERMINOLOGY

IT IS A FACT OF MUSICAL LIFE today that the overwhelming majority of trombones, tenor and bass, used professionally in *any* category of musical activity are of United States manufacture. The cause of this effect is simply that the manufacturers of "The New World" have, since the 1930's, accomplished advances in design, manufacture and quality (plus the ability to effectively market their merchandise worldwide) that have turned the heads of even the most traditionally-minded European players[1].

What is the source of these North American ideas in manufacture and design that now dominate the western world? On whose original designs are their highly-evolved instruments based? In the case of the trombone undoubtedly on those of the German and Viennese manufacturers, whose instruments were (and still are) unlike anything else produced in Europe or elsewhere[2]. While the French, Italians and British craftsmen were turning out instruments with a small bell and tiny interior slide bore -- which produced a sound like ripping calico when played at any level greater than *mezzo-forte* -- the Teutonic makers were producing trombones with large (200 - 230mm) bells, medium to large dual slide bores (lower slide of a greater interior diameter than upper) and, in at least 50% of the better quality instruments, manufactured out of *Goldmessing*, a brass alloy which contained a higher percentage of copper[3]. These instruments had a far warmer sound, and blended more easily with other sections of the orchestra. The sound also projected further without becoming overly "brassy", a property which remains in today's instruments that have a "gold brass" bell section.

Many of the European craftsmen who emigrated to the United States during the early decades of this century were of the German or Viennese school, and it was only to be expected that many of them would in time form the core of the North American musical instrument manufacturing industry as well as a number of the symphony orchestras. Besides, most had brought instruments with them from "The Old Country" and, while French and Italian *woodwinds* were predominant among the early emigrants of this century, the brass were of German or Austrian origin.

A notable example of one of these European craftsmen was Vincent Bach, whose name is today synonymous with excellence in the manufacturing of brass instruments. It has been said of him that he designed instruments in a scientific way, but with results only an artist could achieve[4]. Trained as a mechanical engineer at the *Maschinenbauschule* near Vienna, he studied under some of Austria's foremost brass players, such as Joseph Weiss (first trumpet in the Vienna *Volksopera*), George Stellwagen (first trumpet, *Wiener Tonkünstler* orchestra) and Fritz Werner, virtuoso trumpeter of the Royal Prussian Court.

Whilst visiting the United States initially on a concert tour, Vincent Bach -- now at the peak of his playing career -- stayed on to take up the appointment of first trumpet with the Boston Symphony Orchestra under Dr Karl Muck in 1915. The first edition of his book "The Art of Trumpet Playing" was published in 1923; combining musical experience with his thorough training as an engineer he designed, developed and manufactured a range of trumpets, cornets and trombones that have come to be accepted as "the state of the art" today. He retired in 1960, having sold his entire business to the firm of H & A Selmer[5].

The major brass instrument manufacturers in the United States -- Conn, Holton and King (the H.N.White Company) share to a greater or lesser extent this direct European influence with Mr Bach. Indeed, the first true Bb/F bass trombone (which replaced the low F instrument in America) was manufactured by Conn in 1921, and named the "Fuchs model".

Since the second world war *inter*nationalism in music has been steadily on the increase, with traditional nationalism falling prey to world trends (be they for better or for worse), largely due to improved communication media and jet air travel. This holds equally true for the musical instrument manufacturing industry. London trombonist and pedagogue Denis Wick writes of the "present-day German trombone, which is actually the progenitor of the typical American symphony trombone" as having become "Americanised" in certain aspects of manufacture[6]. He likewise mentions the *un*traditional large-bore instrument made by the Parisian firm of Henri Selmer as having a "modern full-bodied tone quality"[7].

Pursuing the "internationalism" concept further, the hitherto somewhat laggard British firm of Boosey & Hawkes/Besson have made a determined effort since the mid-nineteen-fifties to accomodate American (*and* British!) taste in trombone tone-quality with bore sizes of .523", .547" and .555". Outside the British Isles, however, they are still renowned for their euphoniums and clarinets rather than their trombones.

It would be wise at this juncture to explain the measurements used in discussing the internal and external dimensions of brass instruments. There is an anomalous situation here, as mouthpiece cup diameters are almost invariably expressed in millimetres, *bell* diameters and *internal slide bore* diameters (or, simply, "bore") are expressed in inches or fractions of an inch in English-speaking countries throughout the world, whether metricated or not. Thus, a typical symphony tenor trombone would have a bore of .547" (point, *not* comma five-four-seven of an inch, or inches), with a bell diameter of 8½" and equipped with a mouthpiece of 25,75mm diameter. This mixed terminology is commonplace in the profession, though makers' catalogues usually supply both Imperial and metric measurements in their specification lists. An instrument's mouthpipe or lead pipe, i.e. the short portion of the upper slide which accepts the mouthpiece shank, can be described as open, standard or closed, depending on the degree of venturi effect (or temporary narrowing of the bore at this point).

Double valve bass trombones have their valve rotors arranged in an *independent* or *in-line* manner, i.e. with both valves being attached to the main tubing, thus with two additional (and different) lengths of tubing available to the player, or they can be *non-independent*, i.e. the second valve is attached to the F-attachment's tubing, with the *second* length of tubing becoming available to the player *only after the first valve and its tubing are already in use.* The first valve on *any* trombone equipped with a rotor, be it tenor, bass or contrabass, *invariably* lowers the basic pitch of the instrument by a perfect fourth[8]. The *second* valve on a bass trombone (originally added by Edward Kleinhammer *inter alia* in the nineteen-fifties to make the missing low B natural *permamently* available without having to resort to pulling out the tuning slide of the F section[9]) is built to lower the pitch a *further* ¾ of a tone or a minor third in the case of non-independent valves,

and a minor or major third in the case of independent valves. In both cases the *second* arrangement is both preferable and most widely used, as both valves together then produce a fundamental of D (rather than a flat E or an E flat.) Hence the term Bb/F/D bass trombone.

Little need be said concerning the virtually obsolete bass trombone in low F, although still manufactured with two valves as an F/C/Bb *contrabass* trombone by two German firms[10]. Even less need be said about the narrow bore English bass trombone in G, now mercifully defunct even in brass band circles, which was personally described as "a diabolical example of unimaginitive British plumbing; a 'compromise' instrument which could boast neither the sonority of the F instrument nor the nimbleness of the Bb/F" [11].

The addition of the F rotary valve to the Bb trombone in 1837 by C F Sättler in Vienna must be regarded as the only significant improvement to the basic design of the trombone since its inception, improved dimensions and manufacturing techniques notwithstanding. Any objection to the slight interruption to the otherwise uninterrupted bore of the trombone can be overcome by one word: Quality. If manufacturing techniques are good and real quality control is exercised by the manufacturer, there is no discernable difference in playing characteristics if an F rotor (or even an F *and* Gb rotor) is added to a top line instrument[12]. The additional resistance presented to the air column by the approximately one metre of F tubing is another matter, and will be dealt with in detail in the course of Chapter Two.

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1. *A notable exception is the Vienna Philharmonic Orchestra, whose trombonists must by tradition use dual bore instruments (the horns, too, still play a Viennese single horn in F). The Berlin Philharmonic players switched to Bachs in the late seventies, as have most Parisian players in recent years.*
2. *The firms of Heinrich Thein and Lätsch both manufacture a full range of trombones with dual slide bore. Thein, however, offers all his models with a straight slide bore as an alternative.*
3. *Ordinary, or "yellow" brass, has a copper/zinc ratio of approximately 75:25, while gold brass or red brass has a ratio of 85:15. Beryllium bronze, a variation of red brass, has been used to good effect by the late Renold O. Schilke, and the Yamaha Corporation.*

.../4

4. Selmer Bandwagon, Vol. 15 No. 1 1967, and Preface, Vincent Bach Catalogue, 1975.
5. The H & A Selmer Company, Elkhart, Indiana (now a division of the Magnavox Company) has pledged not only to uphold the highest standards of manufacture, but claims it can duplicate Mr Bach's "legacy of ideas" even more faithfully than was possible in Bach's own Mount Vernon, New York factory.
6. Denis Wick : Trombone Technique, p. 7 O.U.P.
7. Ibid., p. 7.
8. Up until the early nineteen-sixties the firm of Frank Holton and Company manufactured a small-bore Bb/G trombone for student use, specifically for those whose arms were as yet too short to comfortably reach the 6th and 7th slide positions. Today there is an adequate selection of lightweight, medium bore student model Bb/F trombones on the market to solve this problem.
9. Edward Kleinhammer: The Art of Trombone Playing, p.53, Summy-Birchard Company. He writes that after adding the second thumb valve "the player has at his command a complete chromatic scale (down into the fundamental or "pedal" tones)...The trombone originated sometime in the fourteenth or fifteenth century, and now in the twentieth century is finally emerging a tonally complete bass trombone".
10. Gebr. Alexander of Mainz, and Gebr. Thein of Bremen.
11. Galloway, D J : The Trombone Family, Opus Vol. 1, no. 1 1964, Morkel/Müller.
12. The writer once tackled the principal trombonist of the National Symphony Orchestra, Mr Bob Gillespie -- long an antagonist of the F attachment on the tenor trombone -- on the subject, and after a great deal of discussion Mr Gillespie finally admitted that it was only in the extreme high register of the instrument -- D, Eb and F -- that he could discern any interruption in the main bore of the instrument, and this only in the form of slightly increased resistance. However, this alleged resistance may be endemic to the trombone itself: Stuart Dempster, in his book The Modern Trombone (University of California Press) states, on the subject of range: "When asked the question about high range, I always state that the C-sharp above the tenor clef staff is the last really good sounding high note. Above this the notes seem to pinch and tighten a bit, even in players who have them well developed."(P. 101)

CHAPTER II : CATEGORIES & SUBDIVISIONS

"Gone are the days when a musician used the same instrument and mouthpiece for twenty to thirty years. Nothing is static with the contemporary musician. He has more background, more schooling, and he refuses to believe that the existing techniques and designs cannot be constantly improved."[1] Indeed, not since the Golden Days of seventeenth-century Nürnburg has the player had a grander selection of instruments at his disposal.

As suggested earlier, it has become convenient to describe the "bore" of a trombone by giving the internal diameter of the inner slide in fractions of an inch, and the maximum bell diameter in inches and fractions thereof. Tenor trombone bores today vary from .484" to .559", with a number of "standard" sizes in between. Bass trombone bores remain within somewhat narrower confines: .562" to .567". Tenor bell diameters vary between $7\frac{3}{8}$" and 9"; basses between 9" and $10\frac{1}{2}$".

The various types of music encountered in practical playing situations has in many ways determined the dimensions of the four basic categories of trombone, i.e. small- to medium-small-bore tenor; medium-large or "intermediate" sized tenor; large bore or "symphony" tenor, and the genuine bass trombone. *All* these instruments have Bb as their basic pitch, and a slide providing seven "positions", or half-tone shifts. The differences lie in the internal dimensions of the slide and bell sections, and the rotary valve additions to the bell section, and not the length of the slide or the instrument in general.

a) Small to medium-small bore trombones are generally regarded as those having a slide bore of between .484" and .515", a bell diameter of between $7\frac{3}{8}$" and $8\frac{1}{2}$", and a bright, fairly light tone quality. They are also referred to in the profession as jazz or studio trombones. By the same token, they cannot produce an acceptable symphonic sound above a true *forte*, and the built-in resistance that aids the player's stamina and endurance in a three-hour recording or stage band session can be physically frustrating to a player accustomed to the wider bore of a tenor trombone designed for use in a somewhat larger ensemble away from the microphone.

Lightweight outer slides are a popular feature with these smaller trombones (although almost equally popular in all three of the other categories of instrument), but on account of the extremely thin-guage nickel silver or brass used, are more susceptible to dents and "nicking" than the ordinary variety. Students almost invariably begin their trombone-playing career with a small or medium-small instrument, as they are plentiful on the second-hand market and relatively inexpensive. Very few have the added facility of an F attachment.

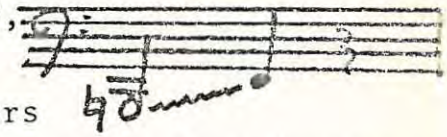
b) Medium-large bore tenor trombones are found only in the bore sizes of .522" or .525", and in every case available with F attachement if desired[2]. The three models marketed today (King 3B+, Conn 74 or 75H, and Bach 36(B)) are all quite different in playing characteristics, supporting the contention that slide bore dimensions on their own provide only a superficial description. The main differences between these three instruments can be ascribed to bell materials, slide materials and bell "core" widths. This "intermediate" category provides the would-be purchaser with a real choice; these instruments can be effectively used in all playing situations from small-group jazz to solo recitals and even first-chair playing in a small to medium sized orchestra.

c) The so-called Symphony tenor trombone has become the accepted standard in orchestras since the second world war, in line with the move towards larger orchestras and an educated public taste for broader tone colours among the brass (and more readily identifiable *timbres* among the woodwind). Where once the "old" symphonic bore of .522" or the now defunct .531"or .533" was considered adequate, the vast majority of professional players and advanced students adhere to today's standard of .547" or thereabouts. As is the case in other categories, this bore size may be complemented by a lightweight slide and/or a bell section made of gold brass or red brass, which further darkens the tone. A relative newcomer is the Friedman model Holton, which has a dual slide bore of .547/559" , which is reputed to offer superior projection in the concert hall. This represents in a way a cyclical return to the dual bore instruments of Berlin and Vienna, though the Friedman trombone would be considered considerably larger than the iii *oder* iv *weite* models that are generally used in those cities.

The slide "bow", that is, the curved section connecting the two branches of the slide, is of a wider radius in the case of symphony tenors, although the Conn 8 and 88H are somewhat *less* wide than others in this category[3]. The mouthpiece receiver pipe, more commonly referred to as the lead or leader pipe, likewise has a wider opening than on smaller trombones, making a larger shank (in diameter and length) necessary on any mouthpiece that is to be used, as is the case with true bass trombones as well. Mouthpiece manufacturers make most of their models from approximately 25mm diameter upwards available with small *or* large shank.

By far the most widely used models in this category are the Bach 42B and the Conn 88H, which are the subject of a direct comparison in the next chapter. Other popular .547" models are made by King (4B & 5B), Holton (TR 150 & 158), Yamaha (.551"), Blessing and Getzen. The once-popular Olds "Opera", originally with nickel silver bell, is no longer produced as the Olds/Reynolds factory closed down in July 1979.

d) Bass trombones: when Bela Bartok wrote his *Concerto for Orchestra* in 1943, the bass trombone he had in mind was the obsolete low F instrument in use in Europe during his formative years[4]. The resultant *glissando* from low B natural up to F,



was perfectly straightforward on the old F instrument, but created headaches for performers on the Bb/F instrument until the double-valve bass trombone became readily available from manufacturers in the sixties. Instead of playing a simple *glissando* from 7th to 1st position on the first harmonic (as one did on the low F bass trombone), today's player has to *glissando* from extended 7th to 1st position with both thumb valves depressed, releasing the second valve at the top of the *gliss.* in order to obtain the terminal F in 1st position, if his second valve is tuned to a flat E natural (bE tuning). If he has the Bb/F/D tuning, he must *glissando* from a low B in slightly extended 5th position, releasing the second valve as he reaches D in 1st position, and "faking" a *glissando* -- usually disguised as a good *legato* -- for the remaining minor third up to F. The ear usually accepts this, and in practice conductors are mainly interested in hearing a good low B natural at the beginning of the *glissando*[5].

As to the incidence of the F attachment option among the three categories of tenor trombone, it should be mentioned that said incidence appears to increase in proportion to the bore size. The two reasons for this are a) The extra resistance of the metre or so of extra tubing is less noticeable to the player as the overall bore size of the instrument increase, and b) the more symphonic-orientated player is the most likely to wish to have those notes at his disposal as are provided by the F section itself, namely, low Eb to low C. There are, however, many players of smaller-bore instruments who wish for the added facility of having C (below middle C) and F available in 1st position, regardless of the nature of the music they perform. Additionally, F attachment trombones of all bore sizes are by nature of their design better *balanced* physically, with the need for a disc balancer on the tuning slide stay done away with, and the apparent "nose-heaviness" of some instruments virtually neutralised. Approximately 10% of small and medium-small bore trombones are equipped with an F attachment, while the percentage in the case of the "intermediate" sized instrument is around 40% and still rising. With the bigger symphony tenor the percentage is estimated to be between 65% and 70%.

With the bass trombone, of course, there is no "option" regarding the F attachment. Real options are the choice or not of a second rotary valve, and whether it is to be operated by the thumb or by the middle finger; whether it is to be "in-line" or non-independent, and what tuning is to be used. A recent survey (January 1984) reveals that out of 22 professional models offered,[6] no less than *sixteen* of them come equipped with two valves![7]

This chapter would not be complete without a brief mention of the ratio of the F(and bE/g/Gb) section bore diameter in relation to the instrument's slide bore. As the rotary valve(s) are positioned on the main tubing some centimeters *after* the end of the slide section, it would seem logical to comply with the gentle conicity of the instrument's bore at this stage, and have the valve tubing commensurately *larger* in bore than the slide. In fact, this is what most makers do, with the valve tubing being between ,032 and ,042 larger in interior diameter than the slides. The H.N. White Company, however, have a policy of matching their ancillary tubing to exactly that of the main slide, so that if the slide bore is a nominal .547", so is the F/D attachment tubing. It must be admitted that this provides a more homogeneous sound at moderate volume, but tends to "kick back" on an *sfp* trigger note.

This policy extends to the King bass trombone range, although the largest of the three models does have wider ancillary tubing (.580" against a .562" slide bore).

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1. Robert Giardinelli, "Brass Unlimited", 1977
2. H. Thein of Bremen, Germany, makes a .528" bore tenor; the Holton-produced Martin .524" model has been discontinued.
3. O. Edward Thayer of Waldport, Oregon, U.S.A., who offers axial-flow valve conversions in place of the usual rotary valve, notes in his price list:
   "Because of its narrower slide, a few trombonists find that the axial-flow valve installed in the Conn trombone (88H) comes against their jaw making it uncomfortable. In this case the slide must be widened. There is no problem with the Bach conversion as the slide is wider."
   The application of Mr Thayer's axial-flow valve is a welcome addition to the professional market, and his letter and diagram are included.
4. This, too, was the instrument for which Brahms, Chopin, Tchaikovsky and Weber wrote. This explains the inclusion of bass trombone only (no tenors) in the oft-criticised scores of Chopin's two piano concertos, where the warm, deep timbre of the low F instrument would have blended easily with the horns and low strings. The lowest note of the F bass trombone (before the advent of the C thumb-valve) was two-leger-lines B natural, which explains the sudden upward leap of a seventh in Tchaikovsky's 1812 Overture and Marche Slave bass trombone parts -- it lacked what is now commonly known as "pedal" Bb. Verdi's Cimbasso (4th trombone) parts are likewise for the F bass -- slide or valve.
5. There is a third possibility of the independent rotor instrument: pull the F section tuning slide all the way out to give a flat E in 1st position, and pull the Gb section tuning slide all the way out to give a sharp F in 1st position. Glissando with the 1st valve alone, substituting it with the 2nd valve at the top of the glissando (on reaching 1st position).
6. This survey includes the range of Yamaha bass trombones. American in design (Renold O. Schilke) and Japanese in manufacture, these instruments are meeting with much popularity in the U.S.A. due to their excellent quality.
7. The reason a bass trombone needs a second valve is to be fully chromatic all the way down to the fundamental or "pedal" harmonic. The low B natural is missing on the Bb/F instrument because the normal Bb slide, which provides seven positions on the tenor instrument, suffices only for six (and that at a pinch) on the "longer" instrument in F, once the F tubing is added. For the same reason of physics it will be found that the distance between 6th & 7th position (on the tenor trombone) is almost 6% more than the distance between 1st & 2nd position. The low D tuning has only 5 positions.

CHAPTER III : COMPARISONS AND EVALUATIONS

" I prefer to use a large bore, free blowing instrument (as little resistance as possible) with a very large mouthpiece" confesses Ralph Sauer, 1st trombone of the Los Angeles Philharmonic Orchestra[1]. Mr Sauer's taste is certainly not unique; a perusal of the International Trombone Association's Journals and Newsletters[2] since 1979 has revealed that all but four trombonists occupying first or second chair in the major North American orchestras play either a Bach 42(B) or a Conn 8(8)H. The other players interviewed play either a King 5B (Cleveland) or Holton "Friedman" (Chicago). Occasional use is made of a Bch 36B in some cases when the repertoire demands. It was also revealed that the second chair player in some cases used a single-valve *bass* trombone for the second parts.

There is a good reason for these choices. In order to maintain a desirable trombone tone quality from *ppp* to *ffff* in an 80 to 120 piece symphony orchestra, the player must have an instrument that will retain its character when played very loudly. This a small or medium-small instrument cannot do, due to the constricted slide bore and inadequate expansion of the bell core. The result is brassy, penetrating, pitchless and decidedly unmusical.

Until the nineteen-fifties, a "symphony" tenor trombone could be any instrument with a bore of .500" to .522" or .531", providing it had a fairly heavily-spun bell to minimise the "breaking-up" of the sound in *ff* and louder. However, with the postwar increase in the overall size of symphony orchestras the G.C.Conn Company began experimenting with pilot models and in 1954 brought out their 8H and 88H models, with a .547" bore, 8½" bell and red brass bell section. Vincent Bach had, in the meantime, been offering 8" bell models with a .522" or .525" bore, and, latterly, a .547" model with 8½" bell (the 34, 36 and 42 respectively). All these were offered with yellow brass bell, the red brass or "gold brass" (in this case the alloy was closest to the German *Goldmessing*) being an extra-cost option.

There can be no doubt that the F attachment versions of these two .547" bore trombone, namely, the Conn 88H and the Bach 42B, are the two most widely used tenor trombones in symphonic circles today, and with that in mind the following direct comparison is offered:

RESPONSE: To a player who has not previously come to terms with a large bore instrument, the Conn is the easier of the two to adapt to, especially for a student who has not yet reached physical maturity.. The instrument projects well, with comparitively little effort, probably due to the high copper content of the bell. However, it can sound thick and "muddy" , particularly in the middle register, when played *piano* with an undeveloped embouchure or one that is less than firm. Intonation is excellent, although it is equipped with a spring barrel should it be necessary to sharpen the low F in 1st position with the F valve. Its air column will accomodate virtually any mouthpiece, even the medium-shallow type used for jazz (providing the diameter is not too small) without the instrument losing its character. Slides of 8 and 88H models encountered during the course of this research have tended to be average; none too bad and none too good.

The Bach 42(B), on the other hand, has the feel and response of a much more "open" instrument, possibly due to a less restrictive venturi effect in the leader pipe. It projects extremely well in either yellow or gold bell versions, although the player has to work a little harder in order for it to do so; it is *not* an instrument for a beginner (even if they could afford it). It is likewise a less accomodating instrument when it comes to mouthpieces that are on the small side; anything smaller than a Bach 6½A or a Wick 9BL will not adequately come to terms with the air column. It, too, is an inheremtly "in tune" instrument, though the fourth harmonic (middle D - the major third of the series) is set a fraction lower than in most other trombones. The 42(B) has, overall, the noblest and most consistemt sound of the two,particularly in *fortes*. One does, however, have to work fairly hard if a lot of brilliance is required. Bach slides are good, if they are kept clean and *very* lightly lubricated, as tolerances are close. The "fore-and-aft" balance is better on the 42B than on the 88H, particularly if the lightweight slide option on the Bach is exercised.

ENSEMBLE BLEND: The Conn will blend with "just about anything", possibly due to its less individualistic and sometimes darker (in *pianos* but not *fortes*) tone quality, although it will probably blend better with another 8(8)H than any other trombone.

The Bach is a superior solo instrument, and in an orchestral section three Bachs (two 42s and a 50) are regarded as an unbeatable combination, but a 42(B) does not blend as easily with trombones of another make as does the Conn -- the only possible exception being the King 5B, with which the 42 blends very nicely indeed. Apart from sectional considerations, the choice must, in the final analysis, be a personal one as far as these two excellent instruments are concerned.

OTHER CONSIDERATIONS: 1983 retail prices for the 42B and 88H were $975 and $636 respectively. The discrepancy can only be attributed to the fact that many more Conns are produced than Bachs, although there is clearly no shortage of buyers for the more expensive instrument. Bach quality control, too, is known to be consistently high, and second-hand Bachs change hands at higher prices than any other instrument (this observation applies to their trumpets, too). Both makes are equally durable, although the Conn lacquer is slightly thicker -- not a good point from the viewpoint of vibration. The ultimate choice may well be determined by what the other members of one's trombone section are using -- or by whatever "tradition" may exist in that regard. Two of America's most eminent trombone sections, however -- those of the Cleveland and Chicago Symphonys[3] -- are comprised of three or four totally different instruments.

OTHER INSTRUMENTS IN THE SAME CATEGORY: Of the same .547" bore, but with a 9" bell. are the King 5B and the Holton TR 158, both with gold brass bells as standard equipment. The Holton "Friedman" model (TR 156; TR 159 with F attachment) has a dual bore slide of .547"/.559". All these are excellent instruments, and the King has the added advantage of a lightweight slide. There are also the King 4B and the new Getzen .547"/F attachment models, both somewhat lighter in tone than all the aforementioned, as was the now defunct Olds Opera model of the same dimensions.

The three trombones in the intermediate category have already been briefly described. The Bach 36(B) is by far the most commonly used in symphony orchestras when a lighter sound is required, and then only by the 1st player.

In the "light music" category, the King 2B and 3B are very widely used, as are the Conn 5H or 6H, and the Bach 12. The King 3B is more commonly found with F attachment than any of the other smaller instruments. The nickel silver bell Conn 48H is popular, as is the red brass bell, dual bore Holton STR 602 (.484"/.495").

A most versatile instrument among the "lightweights" is the Bach 16M -- the "M" distinguishing it from the ordinary 16 which has a dual bore -- which comes with a lightweight slide as standard equipment. It has a bore of .509", compared with the .500" of the model 12, and .491" of the model 8. The 16M has a sound somewhat darker than the King 3B (.508") but a little lighter than the .522" Conn 74 or 75H. A favourite among lead studio players is the extra lightweight version of the King 2B, with lightweight slide *and* bell. There is also a dual bore version (.481"/.491"). All makes considered, the .500" or .508 or 9" models are the most widely used.

Bass trombones: As was mentioned earlier, the early Conn Fuchs model represented a link between the U.S.A. trombone and its German/ Viennese progenitors. This instrument had its tuning slide in the *slide* section, and an uninterrupted conical bore from the exit of the F valve tubing to the bell flare. This was the first true bass trombone in Bb/F produced in the United States, and its production continued until the mid-fifties.[4] This model 70H, as it was designated was replaced by a new model 72H of somewhat more modest internal dimensions, as Conn's design policy had become influenced by the enormous volume of school and college instruments sold. However, it was not long before they again heeded the minority but prestigious voice of the professionals, and issued the 60H and 62H (single and double trigger) models which were a resuscitation of the Fuchs model. To keep those who wished for a lighter, brighter sound in bass trombones happy, they replaced the 72H with the 71H and 73H, which are still in production. The red brass bell 60/62H has since given way to the inline rotor 83H, while the top of the line in Conn bass trombones is now occupied by three new models designed by the Los Angeles craftsman Larry Minick. These are the 110H (single trigger), 111H (double trigger, non-independent) and 112H (double trigger, inline valves). All are equipped with a red brass 9½" bell, and all these Conn models are tremendously popular.

Again, in the symphonic context, it is the Bach which is most widely used. The 50B is a single trigger, 9½" bell, the 50B2 double non-independent triggers, and the 50B3 double inline rotors. All have the same slide bore of .562", and all are available with a gold brass bell and/or lightweight nickel silver slides at extra cost. There is a 10½" bell version of the two double trigger models, designated by the suffix L. These are all heavy but extremely responsive instruments, totally in tune, and with a magnificent tone quality at all dynamic levels.

King market three excellent models, the Duo Gravis, 7B and 8B, all double triggers (two of them inline) with red brass bells.

A third contender in the bass trombone field has emerged since 1965 is the Frank Holton Company, for some years now a division of Leblanc in the United States. Edward Kleinhammer designed a full bore bass trombone for them which was available in single or double-trigger form; there was also a kit marketed for the single valve version consisting of a second rotary valve, tubing and thumb linkage which replaced the tuning slide on the F section. These kits have been succesfully modified to fit other single valve instruments. Then, in the second half of 1979, another eminent American bass trombonist, Louis van Haney, developed the Holton TR 180, with a 10" red brass bell and a very open leader pipe, and two valves operated by *one* trigger which could be moved in two different planes(all Holtons have a .562" slide bore). This is an exceptionally free-blowing instrument, and won immediate popularity with showband, small group and symphonic players alike. Close on its heels was the TR 181, which is the inline version, and has become the company's best-selling bass trombone[5].

Up until the factory close-down in July 1979, the Olds and Reynolds models were reasonably popular. The "George Roberts" model by Olds was designed primarily for studio use, having a .565" bore and a 9" (only) red brass bell with a relatively wide core. In spite of this, the instrument was ill-balanced and does not produce a very sonorous sound. The short-lived inline double trigger version was better balanced, and more popular (P-24G). Reynolds made a single and double trigger (bE tuning, in the latter case) model with 10" red brass bell which, for some reason, was very popular with European players at one period[6]. The Olds "superstar" model was simply a Reynolds with the Olds name stamped on it, and silverplated.

The Yamaha trombones, although of American design are outside the scope of this work. It suffices to say that their 613R "custom" model is virtually as good -- and a s expensive -- as its U.S.A. counterparts.

There have been, over the years, various "non-conformists" as regards dimensions. Possibly the most widely used among tenor trombones was the Olds "recording" model, which had a moderate dual bore (.495"/.510"), larger than average bell (8½") and an overall character very close to that of its European progenitor. Similarly, the precursor to the current King 5B had, instead of equal slide bores *and* F section bore, a dual bore of .536"/.546" and an F section bore of .562" -- conical rather than cylindrical in nature.

STUDENT MODELS: These "second line" instruments are usually made on the same assembly line as the top quality models, and mostly with the same materials. Not quite as much detailed scrutiny goes into their production, though, and the result is a substantial saving in labour which is passed on to the customer in the form of a price that is considerably lower than that of the equivalent "top quality" model.

Students need an instrument that plays *in tune*, i.e. the natural harmonics bear the correct relationship to each other. They also deserve a trombone that will produce a reasonably good sound if the necessary effort is put into it, and the younger ones need a *light* instrument with an F attachment, as 6th and 7th positions are often beyond the reach of children under 15 years of age.

For these reasons the following student-priced trombones *with* F attachment are listed and evaluated:-

BACH Mercedes II *Bore: .510* *Bell: 7½"*

Comment: A good, lightweight trombone, virtually an F attachment version of the 16M, but without the lightweight slide.

BLESSING B88R *Bore: .547* *Bell: 8½" red brass*

Comment: A medium priced imitation of the Conn 88H; a good instrument, although the 5th harmonic tends toward sharpness on some instruments (as does the Yamaha tenor).

CONN 50H Director *Bore: .522"* *Bell: 8½"*

Comment: A fairly old design, this a student version of the 75H.

KING 607F *Bore: .525"* *Bell: 8"*

Comment: This is a new addition to the student range of trombones, being identical to the highly successful 3B+ but without its gold brass bell and lightweight slides. This is an excellent instrument for the young player.

HOLTON TR 658 *Bore: .500"* *Bell: 8"*

Comment: The most lightweight tonally and physically, this model has good balance. Excellent for the beginner.

HOLTON TR 680 *Bore: .547"* *Bell: 9"*

Comment: The best "buy" for the intermediate to advanced student. This model has a broader tone than the Blessing.

The King 607F and the Holton TR 680 are especially recommended.

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1. Ralph Sauer, Trombone Basics, I.T.A. Journal Vol. V 1977.
2. The writer has been a member of the International Trombone Association since 1977, and became a Charter Life Member in May 1983.
3. The trombone section of the Cleveland Orchestra (Robert Boyd, principal) use two King 5B's in combination with a Bach 50B2 bass, with the alternate principal playing a Conn 88H. In the Chigaco Symphony Orchestra section, Mr Jay Friedman plays his "own" model Holton, Mr Crisafulli plays 2nd on a single valve bass, and Mr Kleinhammer plays an extra-large bore bass which was custom built for him.
4. This was the trombone on which the sound of the eminent George Roberts became known to the record-buying public -- not the later Olds and Holton models which bore his name.
5. Letter from Mr Stan Surber of Leblanc to the writer.
6. Conversation between the writer and Berlin free-lance trombonist.
7. The writer shares Denis Wick's contention thatno child of less than about twelve years should be taught the trombone. "A certain degree of maturity of body -- lip and arm length -- and mind are necessary." (Denis Wick, Trombone Technique, p. 24, O.U.P.)

CHAPTER IV : INTRINSIC TONAL WEIGHT

THE CONCEPT of judging the tonal weight or, more explicitly, the lightness or heaviness of an instrument's tone quality is not new. But the concept of "removing as much of the guesswork as possible" from the evaluation of a particular model of instrument through the systematic tabulation of relevant factors certainly is.

It is a feature of lateral thinking[1] that a solution to a problem can be found by jumping to a hypothetically correct answer and working backwards from that point until the question is linked up with "in reverse". Unfortunately, this technique does not work in the case of musical instrument evaluations. While it *is* possible to derive the most generalised idea of its playing characteristics *via* the meagre specifications published in the maker's catalogue, disillusionment or, at best, surprise can usually be expected on receipt of an instrument ordered on an unseen basis. The "hidden" characteristics are described in no maker's catalogue.

In the following chart, the five measurement points or *loci* have been selected for various physical and acoustical reasons which have a direct bearing on the instrument's intrinsic tone quality. As acoustics fall outside the scope of this Thesis, a brief explanation of the significance of the five chosen *loci* follows:

LOCUS 1) The interior slide bore. This is self-explanatory, as this measurement is basic to the intrinsic nature of the instrument;

LOCUS 2) The bore of the F section tubing. While this measurement obviously cannot influence the tonal weight of the "open" Bb trombone, it does give a meaningful indication of the bore in the early part of the bell section, i.e. immediately prior to the tuning-slide;

LOCUS 3) The diameter of the bore at the commencement of the bell proper, i.e. at the *exit* from the tuning-slide; this, too, is largely self-explanatory. It should be noted that it is only at this point that the gold or red brass component begins to influence the overall *timbre*[2].

LOCUS 4) A point exactly seven and a half inches from the terminus of the bell is regarded by designers of amplification equipment for wind instruments as the optimum point for pick-up placement[3]. This is a representative point in the conical expansion of the bell core.

The decimal point has been removed from these measurements.

LOCUS 5) The maximum diameter of the bell flare, i.e. the rim of the bell. To the casual observer this would appear the most obvious dimension in a trombone, but it is relatively insignificant, and for this reason the figure has been halved to bring it into proportion.

In addition, a nominal figure of 30 is added to the total sum should the instrument be equipped with a tone-darkening gold or red brass bell. As the Tonal Weights for the instruments charted range from 3230 to 4680 nominal units, this figure represents a pragmatic average of seven and a half per cent, the degree to which it is estimated the change in bell alloy will add weight to the tone.

The playing of these instruments in actual practice suggests that to the trained ear, as well as the tape recorder, the Intrinsic Tonal Weights as calculated in the following table correspond very closely indeed to what the instrument will "deliver" in real life. It is suggested that these estimates will stand scrutiny in any practical playing situation using any of the models listed, and should thus be of real assistance to any prospective purchaser. The figures explain, for instance, why a standard yellow brass Bach 42B has a heavier sound than the Conn 88H with its red brass bell, and why the Olds P-22 (or P-24G) bass trombone is often used as an extra-large bore tenor.

All measurements are in decimal points of an inch (with the decimal point itself removed for clarity), as all measurements in respect of American trombones are still expressed in inches outside of continental Europe. The theoretical "cross-over point" between tenor and bass trombone remains elusive, but would probably occur in the region of 3575u to 3600u.

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1. *Edward de Bono: Lateral Thinking for Management, Chapter 2, Pelican Books*
2. *An exception in this regard is the Conn 60H & 62H, where the red brass component commences at the exit from the F section tubing. As these models have their tuning-slide in the slide, the conical bore continues without interruption into the bell proper.*
3. *King Ampliphonics; 1978 Catalogue.*

A GUIDE TO THE INTRINSIC TONAL WEIGHT OF SELECTED TROMBONES

MANUFACTURER'S NAME	KING	HOLTON	KING	OLDS	REYNOLDS	CONN	BACH	KING	OLDS	CONN
MODEL	605/F	TR-658	3B/F	REC/G	CONTEMPORA	75H	36BG	4B/F	OPERA	88H
BORE of hand slides (1/100")	491	500	508	502(av)	515	522	525	547	554	547
BORE of F section	508	500	508	515	515	536	547	547	565	562
DIAMETER of beginning of Bell	825	835	845	845	845	855	870	875	875	875
DIAMETER of Bell Core ($7\frac{1}{2}$" from rim)	1036	1047	1052	1057	1057	1050	1062	1065	1058	1062
DIAMETER(max.)of Bell	370	400	400	425	425	400	400	435	425	425
ADD 30u if red/gold brass bell				30	30	30	30			30
ESTIMATED TONAL WEIGHT	3230	3282	3313	3374	3387	3393	3434	3469	3477	3501

	BACH 42B	KING 5B	OLDS P-22	KING DUO GRAVIS	KING 7B	CONN 73H	YAMAHA YBL-321	BACH 50B3G	HOLTON TR-180	BACH 50B3L
Slide	547	547	565	562	562	562	563	562	562	562
F sec.	562	547	585	562	562	573	574	579	581	579
Beg. bell	898	905	940	965	965	965	965	990	980	998
Core	1075	1078	1085	1096	1096	2000	2000	2005	2000	2016
Bell	425	450	450	485	485	475	475	475	500	525
Gold/Red bell		30	30		30		30	30	30	
E. T. W.	3507	3557	3655	3670	3700	4575	4607	4646	4653	4680

CHAPTER V : MOUTHPIECES

FOR NO DISCERNABLE REASON other than the New World's protracted resistance to metrication[1], the North American trombone-playing fraternity appear to have settled on a mouthpiece cup diameter of 25,4mm -- just one inch -- as the "standard" for solo, chamber or first chair symphonic playing. Undoubtedly the best-known upholder of this "tradition" is the Vincent Bach Corporation, whose medium-deep cup model 6½AL has long established itself as an industry standard in the eyes of serious trombonists. Sharing the same cup diameter and very similar interior dimensions are no less than *thirteen* other commercially manufactured trombone and euphonium mouthpieces, and sharing the designation 6½AL no less than six others, albeit with somewhat varying diameters[2].

While it may well be the convenience and security of conformity that favours the use of the one-inch mouthpiece, no compelling reason has yet come to light for this almost blind acceptance of the 24,5mm diameter as supposedly ideal. If anything, it has been found to be too *small* and even restrictive, following closer investigation by the majority of symphonic players in the U.S.A. In reality mouthpieces with a fractionally wider diameter, and more V-shaped cup, are used by professionals to a far wider degree[3]. Models such as the Bach 5G (25,5mm), Conn "Remington"(25,5), Wick 5AL and 4AL (25,75 and 26mm), Giardinelli Symphony T (25,8) and Schilke 51D and 52E2 (25,5 and 25,9mm) enjoy, in combination, a far wider useage among professionals than the 25,4mm 6½AL.

There are a great many tenor trombonists who prefer an even larger cup. The deep, open-throated Bach 4G and the fairly new Wick 4½AL are firm favourites with orchestral second trombonists, as these mouthpieces allow a better "bridge", tonally, between the first and the bass trombone in any ensemble, even if the second trombonist is playing an instrument identical to that of the first player. Mouthpieces with diameters in the vicinity of 26,25mm are likewise widely used, the criterion being tone quality above all else (Bach 3G, Giardinelli 3D or 3G, and Schilke 53 are typical examples). Many professionals and some students use a model of their own (or another trombonist's) design which is custom made and does not appear in any catalogue. The Schilke 52E2 is an example of such a modification that has proved popular enough to be marketed commercially.

It must surely be the essence of human nature, particularly when a creative career is followed, to have no two performers agree one hundred percent on what mouthpiece is *the* best choice in a given situation: *Quot homines tot sententiae*. Indeed, personal variations of taste are logical for orthodontal as well as esthetic reasons, as no two jaw/teeth/lips patterns are identical. A choice of mouthpiece is -- or at least *should* be -- an intensely personal one, arrived at after a good deal of experimentation and evaluation in *real* performance situations, and not as a result of solitary practise on its own. If a generalisation *can* be made in this regard, it is that the mainstream of "serious" tenor trombonists use a mouthpiece having an internal cup diameter of between 25,3mm and 26,3mm.

The requirements of the *non*-symphonic or jazz/showband trombonist are rather different, and are dictated to a large degree by the need for a brighter sound and attack, as well as the endurance required to maintain a high tessitura for up to three hours at a time. Likewise, instruments of a medium-small bore are used in this category, as has been explained in a previous chapter, and the mouthpiece must (as in other categories) be compatible with the instrument. The player cannot comfortably use a small-shank version of his symphonic tenor mouthpiece and hope for the required result; he will experience a lack of endurance and will have too dark a sound to blend with the trombone section. He will also create a mismatch of equipment if the mouthpiece is too large in cup volume and/or has too open a throat and too flaring a backbore, and will experience excessive back-pressure from the instrument itself, particularly in a *sforzando* attack. In *piano* playing the effect will be reversed, the open throat providing *insufficient* back-pressure for safe entries and sustained *legato* playing in the upper octave of the instrument's working range. Too deep a cup in this context will make the necessary "lead" trombone sound elusive, and a convincing blend within the section may also be harder to attain. Physical volume in the recording studio is not a consideration, as there is at least one microphone for the section of three or four trombones. Moreover, the louder the playing becomes in this studio environment, the harder the recording engineer finds it to balance the trombone section with the rest of the ensemble[4]. (Significantly, the George Roberts model bass trombone manufactured by the now defunct firm of Olds was designed with characteristics somewhat different from more symphony-orientated models).

If there is a "standard" mouthpiece among jazz and "session" players, it must be the Bach 11C (24,7mm; medium-shallow cup); this model is *extremely* widely used worldwide. However, if the player's principal activity is symphonic -- with larger instrument and mouthpiece to match, it is usually less of an ordeal when changing to one's smaller "jazz" instrument to use a "jazz" mouthpiece that is as close as possible in diameter and rim countour (but not depth and backbore) to one's principal equipment. Three fairly large diamter mouthpieces having the necessarily medium-shallow cup, and which can be said to "meet the symphonic trombonist halfway" as far as dimension are concerned, are the Giardinelli 4M (25,4mm), Bach 4C and Wick 5BS (both 25,75mm). Alternatively, if the smaller diameter does not make for discomfort, the Bach 7, 9 or 11 (not 11C) are potentially good "session" mouthpieces for those who normally use larger equipment.

Equipment varies considerably among the famous jazz soloists. J.J. Johnson, the doyen of "be-bop" trombone playing, uses the production King 11 on his model 3B; the late Kai Winding used a Giardinelli 6D, while German *avant-garde* soloist Albert Mangelsdorff upsets convention by using a Giardinelli 3D (26,2mm) with medium-flat rim. Jimmy Knepper projects his individuality *via* a Bach 6½AL on a Bach 36 -- a medium-*large* bore instrument.

On the subject of rim contours, manufacturers are conscious of the need for a practical balance between too *narrow* a rim which, while increasing flexibility, would cut into the player's embouchure tissue in sustained high register playing, and too *wide* or *flat* a rim, which spreads pressure but puts a lot of useful lip tissue out of circulation in the process (the so-called "cushion" or extra-wide rim is a crutch for an undeveloped embouchure -- as well as *keeping* it undeveloped). Thus, a certain amount of compromise is built into the rims, as the sizes vary from large to small. Thus, the *standard* Giardinelli rim (they also offer a semi-flat and a "cushion" rim on any model) is very slightly flatter and wider on their medium-shallow 4M, 5M and 6M models than on their deep or medium-deep cup larger models. The Bach 12C has a considerably wider rim than the 15, 11, 9 or 7, for instance. Too polar opposites in tenor trombone mouthpieces are the famous Conn "Remington" model, which has a deep V-cup and a very rounded, medium-narrow rim, and the Bach 12 EW with an extra-shallow cup and a wide, very slightly rounded rim.[5] As a study of the Giardinelli, Schilke or Bach mouthpiece catalogues will reveal, virtually any cup shape can be mated to any rim[6], although musical results are not guaranteed.

The *bass* trombonist's mouthpiece requirements are very different from those of his tenor counterpart in *any* context, due to the substantially "darker" sound he is required to produce, the facility in the F (and D) "trigger" register he expected to display, and the considerably larger volume of air contained in his instrument. It is not merely the .562" (or larger) slide bore which dictates this last-mentioned factor, but the very large bell *core* found on the better instruments. Like his tenor counterpart, his instrument is pitched (basically) in "tenor" Bb, but he is expected to work with facility in a tessitura that sometimes lies an octave or more below the tenor trombones (in recording session or showband work), or to project the F and/or D section notes in an orchestral *fortissimo* that will match the rest of the orchestral brass section.[7]

While there can be no doubt that the Bach 1½G is the world's most popular bass trombone mouthpiece, most symphonic players use a yet larger model. The Schilke models 59 and 60 (28,5 and 29mm respectively, against the 27mm of the 1½G) have proved so popular in the last decade that the Bach Corporation has seen fit to add the 1¼G and 1G (27,75 and 29mm respectively) to its catalogue (1975). Other widely used models are described in the lists at the end of this chapter.

For chamber music or smaller ensembles, the bass trombonists may choose to use a mouthpiece that is slightly smaller in diameter but which retains almost as deep a cup as the larger models. The very popular Bach 2G (26,75mm), the Giardinelli Symphony B (26,75) and the Wick 3AL (26,4 mm, and originally the largest in the range) are examples, and are particularly well suited to use on a large bore tenor with F attachment, should the player for some reason wish to use such an instrument in lieu of a true bass trombone. An ideal combination for players doubling between tenor and bass instruments on a daily basis is the Holton L(arge) B(ore) T(enor) and VH(or model 181) bass -- both Van Haney designs(the former based on a pre-war German Kruspe model) with a medium-narrow rim.

There is a basic tendency among non-professionals to overlook two basic facts concerning the choice of a mouthpiece:

1) The mouthpiece is the one piece of ancillary equipment that will *most influence* the playing characteristics of any brass instrument;
2) The need for *matching equipment*, or compatibility between the instrument one plays (or intends to play) and the mouthpiece with which it is equipped.

Whereas a Bach 6½AL mouthpiece *may* come to terms with the small bore of a King 2B or Conn 4H, and although a Giardinelli 3D is compatible with a King 3B in the hands of Albert Mangelsdorff, these can be regarded as extreme applications, representing the approximate limit of what these trombones of comparitively modest bore diameter can cope with[8].

The mirror image of this problem occurs when too *small* a mouthpiece is used on a really large bore symphony-tenor trombone, such as the King 5B, the Holton "Friedman" model, or even the highly accomodating and "forgiving" Conn 8H or 88H, even if the mouthpiece has the correct large shank("adapters" cause a further step in the air column and are to be avoided). Again, high register playing on the larger instrument will become more difficult if the mouthpiece's cup is too shallow and the throat and backbore too restricted, due to the additional turbulence caused by the sudden "step" into the large slide bore of these instruments. In a jazz or light music context it is quite acceptable to use a symphony tenor for the "inside" (2nd and 3rd) parts, i.e. between the 1st or "lead" player and the bass trombone. Mouthpieces which will be compatible with these bigger instruments, yet which will produce the necessarily lighter *timbre* are the Bach 6½AM, Giardinelli 4M or 5D (on a large shank, naturally), Wick 9BL or a Bach no.11 with a factory-enlarged F414 or G420 throat and backbore(also the large-shank version) If, in the same vein, one should wish to use a full bass trombone as an "extra-large tenor", then most instruments will happily accept a Bach 5G, Wick 6BL, Conn "Remington" or even a Bach 6½AL -- but nothing smaller! It is the element of "coupling" that is so important[9].

CONCLUSION:-

In the final analysis, when the experimentation is over with, it is probably the aphorism of the late Duke Ellington that rings truest of all, in both the jazz *and* the symphonic context:
"If it ***sounds*** right, it *is* right." *Probatum est.*
A trombone player requires a mouthpiece that will provide him with his full normal range *with the best possible tone quality*, the final choice being determined by rim comfort. Secondary and tertiary factors are the model of instrument played, and the nature of the music. Primary factors are the tone quality, comfort and general utility afforded by a selected mouthpiece. Endurance will come with practice.

The following lists of selected mouthpiece models for various categories of playingmay well be of assistance; it will be noticed that there are some applications which overlap.

* An asterisk denotes "specially recommended".

Abbreviations i.r.o. cup depths: S=shallow; M=medium; D=deep;X=extra.

LIST A: Symphonic-type tenor trombone mouthpieces (large shank)

	MANUFACTURER'S NAME	MODEL NO.	CUP DIAM.(mm)	CUP DEPTH
	Bach	6½AL	25,4	MD
	Schilke	50	25,4	MD
	Wick	6BL	25,4	MD
*	Bach	5G	25,5	D
	Conn	Remington	25,5	MD-D
*	Holton	VH LBT	25,5	MD
	Schilke	51D	25,6	MD
	Giardinelli	SymphonyT	25,75	MD
*	Wick	5AL	25,75	D
	Wick	4½AL	25,75	D-XD
*	Schilke	52E2	25,9	D
	Wick	4AL	26,0	MD
*	Bach	4G	26,0	D
	Giardinelli	3G	26,1	MD-D
	Schilke/Yamaha	53	26,2	MD
	Bach	3G	26,25	MD-D

LIST B: Mouthpieces suitable for jazz, showband and "session" work (small tenor trombone shank)

	Bach	14D	24,5	S-MS
	Wick	12CS	24,5	MS
*	Bach	11C	24,7	MS
	Schilke/Yamaha	47	24,9	MS
	Giardinelli	5M	25,0	MS
*	Wick	10CS	25,0	MS
*	Giardinelli	4M	25,4	MS
	Bach	4C	25,75	MS

LIST C: Tenor and bass trombone mouthpieces suitable for beginners and younger students; physically mature students should graduate to List A as soon as is practicable:

Tenor:-	Bach	15	24,5	M
	Giardinelli	6D	24,5	M
	Schilke/Yamaha	46D	24,6	MD
*	Bach	11	24,7	M-MD
	Bach	9	24,75	M
	Bach	7	24,85	M
*	Wick	9BS	25,0	M
	Benge	6½AL	25,25	M
*	Conn	3	25,35	M-MD
*	Giardinelli	4D	25,4	M-MD
	Bach	6½A	25,4	MD
	Wick	5BS	25,75	M
Bass:-	Bach	5G	25,5	D
*	Wick	5AL	25,75	D
*	Wick	4½AL	25,75	D-XD
*	Bach	4G	26,0	D
	Giardinelli	3G	26,1	MD-D

.../List D

LIST D: Tenor/Bass mouthpieces of a transitional nature, for the effective performance of bass trombone parts on a large bore tenor trombone with F attachment:

	Wick	*4½AL*	*25,75*	*D*
	Bach	*4G*	*26,0*	*D*
	Bach	*3G*	*26,25*	*MD-D*
*	*Wick*	*3AL*	*26,4*	*D*
	Schilke/Yamaha	*57*	*26,5*	*MD-D*
	Giardinelli	*2G*	*26,5*	*D*
*	*Bach*	*2G*	*26,75*	*D*

LIST E: Mouthpieces for effective use on full bass trombone:

	Giardinelli	*SymB*	*26,75*	*D*
	Bach	*2G*	*26,75*	*D*
	Jet-Tone	*Bass*	*27,0*	*D*
	Bach	*1½G*	*27,0*	*D*
	Giardinelli	*1G*	*27,0*	*D*
	Wick	*2AL*	*27,0+*	*D*
	Holton	*181*	*27,5*	*D*
	Schilke	*58*	*27,5*	*D*
*	*Bach*	*1¼G*	*27,75*	*D*
*	*Schilke/Yamaha*	*59*	*28,5*	*D-XD*
	Bach	*1G*	*29,0*	*D*
*	*Schilke*	*60*	*29,05*	*XD*

---

1. *Mr. Robert Sabbag, in his novel "Snowblind" (Picador), puts it more strongly: "For almost two hundred years Americans have been trying to come to grips with the metric system; refusal to adopt it, from black market conversion tables in the elementary school arithmetic classroom to bisystematic mileposts on the nation's interstate highways, has come to be regarded as one of the unimpeachable insignias of citizenship...The International System of Units -- for that is what theirs, the one the rest of the universe uses, is called -- is un-American; if it is not furlongs or fathoms it is foreign, it is something we grant chemistry teachers for their amusement." (P. 93)*
2. *Himes, A.C., A Guide to Trombone Mouthpiece Comparisons, Journal of the International Trombone Association, Vol. X No. 2 1982.*
3. *Journal and Newsletter of the I.T.A.; interviews with orchestral trombone sections in the U.S.A. 1979-1983.*
4. *I.T.A. Journal Vol. XII No. 1 1984: interview with Lloyd Ulyate, a prominent Los Angeles "session" player: "Our playing is so much different than (sic) playing in a concert hall, so consequently we don't play too loud (sic). If we do, they turn your mike off and you might leak through some viola mike and not sound too good!"*
5. *The writer has found both rims to be equally uncomfortable.*
6. *As this Thesis is being typed, a totally new range of trombone mouthpieces by Doug Elliot of Silver Springs, Maryland, U.S.A., has been announced, which have interchangable rims and shanks. Giardinelli will also make mouthpieces in this three-piece format if requested.*
7. *Philadelphia Orchestra trombonist Henry C. Smith is reputed to have said "If Ormandy only knew how loud we really play, he'd probably pass out."*
8. *The writer's Reynolds -- with a .515" bore -- does not feel really comfortable with any mouthpiece larger than a Giardinelli Symphony T (25,75mm; MD).*
9. *Arthur H. Benade, in The Physics of Brasses (Scientific American, July 1973) states: "It is only in the past few years that we have begun to have an understanding of the acoustics of mouthpieces...Too much compression forced on the (sound) wave will cause distortion."*

CHAPTER VI : SUMMARY & PROGNOSTICATIONS

"THE TROMBONE is a symbol of long life...For five hundred years it has continued with only small changes, while the rest of western instruments have undergone drastic changes or have been invented" writes America trombonist Stuart Dempster.[1] As mentioned in an earlier chapter, the addition of the rotary valve and the F section to the bell joint is the only significant structural change in the instrument (and even this is optional in the tenor trombone) since the days of the Sackbut; modifications to the bore and bell, as well as the further refining of the alloys used in its construction are just that : refinements.

And it is precisely in this area -- the further refinement of a basically sound musical instrument -- that developments of the foreseeable future will take place. It would be unrealistic to expect any radical development or modification, as the result would no longer be a *bonafide* trombone.

Such refinements are nearly always the idea of the player, rather than the manufacturer. While the latter is, understandably, content to continue with a range of instruments that sell well, the former is constantly striving to improve his own *and* his instrument's performance in some area. The recent advent (and wholehearted acceptance) of the double trigger bass trombone with inline rotors is proof of this. The abovementioned Mr Dempster has even had a second inline rotor fitted to his 88H *tenor* trombone in the interests of greater facility[2]. The two models of Bach tenor trombone that are available with F attachment, namely the 36B and the 42B, are now both available from the factory with *removable* F sections and valves as models 36C and 42C respectively. The purchaser pays a 20% premium for this added versatility, but -- as in the case of the most expensive inline bass trombones -- there is no shortage of buyers.

A minor change that is already taking place is the increasing use of the self-lubricating plastic derivative, Delrin. Linkages for F attachments, particularly the miniature ball-joints used by Holton and others, become absolutely silent compared to their metal counterparts when made of this material. Static components such as rotary valve cork plates are more wear-resistant when made of Delrin, as well as lighter[3].

Lightness in metals, too, is an area in which further development could take place, such as the experiments with thin-guage beryllium bronze carried out by the late Renold O. Schilke.

A definite taste for a truly "intermediate-sized" tenor trombone has also begun to emerge; there is just too much of a "gap" between a Conn 75H and an 88H, or between a Bach 36 and 42. The Bach 36B with gold brass bell has become extremely popular as the tenor trombone with the most substantial tone short of moving to the fully symphonic .547" bore size. By the same token, the French Courtois model 144B, with a .540" bore, has been hailed "as being nice for high register playing, with less problems in endurance and a lighter sound than the Bachs "(42B's) customarily played.[4] It may not be long before an enterprising maker offers a model with a .533" or .536" bore, 8¼" or 8½" bell, and a mouthpiece receiver that will accept a large shank.

It is doubtful whether bores will get any larger, even among bass trombones; a pragmatic limit appears to have been reached in the Bach 50B2L or 50B3L, and the King 8B, all of which have 10½" bells and very large bell cores. The next step would need to be weight *reduction* -- particularly in the case of the Bach -- without reducing durability. A *three*-valve bass trombone is by no means out of the question; there is room for a third rotor and tubing in the bell section of most models, and thumb and finger linkages present no real problem. It should also be mentioned that the largest bore *tenor* on the market, the Friedman model Holton with a dual slide bore of .547"/559" has proved more popular in its F attachment form, the TR-159, which would appear to partially fill the "gap" between tenor and bass trombones as we understand them today.

The demise of the Olds/Reynolds factory has been mentioned in an earlier chapter. Information received from Mr Robert Giardinelli of New York indicates that the tooling and trade names have since been bought by others in the music trade, and there is a good chance that certain selected models will be resurrected in due course, should the market demand it.[5] Possibly the trade name "Phoenix" should be considered.

The era of "personalised" instruments is likewise in evidence. The advent of Mr O. Edward Thayer's "axial-flow" valve as a replacement for the rotary valve is a case in point (letter and prospectus included). Two American music firms are offering so-called "open wrap" conversions for the valve tubing on existing trombones.[6] By "open-wrap", a re-arrangement of the tubing is understood which avoids any tight bends, thus -- theoretically, at least -- reducing the resistance felt by the player when using the valve(s). One of these firms even invites customers to design their own custom trombone by specifying the make and model of bell required, plus slide bore, plus rotor attachment style (if any). The one physical disadvantage of the "open-wrap" arrangement is that the ancillary tubing projects out past the instrument's main tuning slide, making for an extremely hazardous situation should be player be sitting up against a wall in the back row of an orchestra pit, for instance.[7]

In conclusion, it can be unequivocally stated the trombone of United States manufacture -- with due acknowledgement to its German/Austrian progenitors *and* its British and Japanese imitators -- will continue to dictate the nature of the equipment used in orchestral trombone sections throughout the world.
And for many decades to come.

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1. *Stuart Dempster: The Modern Trombone, p. 79, University of California Press.*
2. *While the F series of overtones is obtained by depressing the first valve (trigger), the Gb (or G) series is obtained independently with the second trigger. Both depressed simultaneously makes the low D (or Eb) series of overtones available. Thus, long and rapid slide movements are virtually eliminated, while the perfect intonation and character of the slide instrument are retained.*
3. *C. Ward and E. Chesko: Plastic in Brass Instruments, I T A Newsletter Vol. VIII, no. 3, 1981.*
4. *Jay Hildebrandt:* Le Quatuor de Trombones de Paris, *I T A Newsletter Vol. VIII, no. 2, 1980.*
5. *Letter to the writer, January 24th 1983.*
6. *The firms are: Mid-South Music, Memphis, Tenessee, U S A , and Robert Giardinelli Band Instrument Company, New York, U S A.*
7. *A humourious and ironic overview of this and other hazards is given in Alan Raph's booklet, "Le" Trombone (AR Publishing Company, Box 292, Candlewood Isle, Connecticut, U S A.)*

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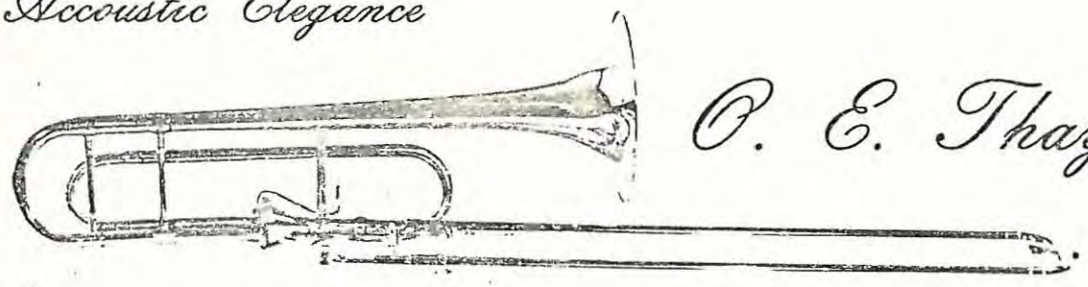
Accoustic Elegance



O. E. Thayer Co.

Axial-Flow Valve

Box 475, Moffitt Rd. • Waldport, OR 97394
(503) 563-2138

April 18, 1983

Mr. David J. Galloway
P.O. Box 20314
NEWCASTLE 2940
Republic of South Africa

Dear Mr. Galloway:

The delay in answering your letter is partly explained by the fact that we are again working in our own shop in Oregon. At this early stage in the program this seems to be the most advantageous. Consequently, your letter dated January 9 was embarrassingly late in getting here today. I hope the return is more efficient.

The enclosed information should answer your primary questions. The double valve bass shown is in fact like yours, a Bach 50B. The performance of these instruments is gratifying. In fact the immediate response of all musicians has been surprisingly positive.

You are quite welcome to use any information or illustrations in your thesis. I believe we can safely state that your theme dealing with comparisons of American trombones would aptly rate the Axial-Flow Valve equipped instrument as a contrast. It does come very close in sounding and performing as a straight horn. In comparative tests we have run with standard instruments, you could tell which instrument you were hearing with your back turned.

If we can be of further assistance, please feel free to write.

Yours for better instruments,

Ed Thayer

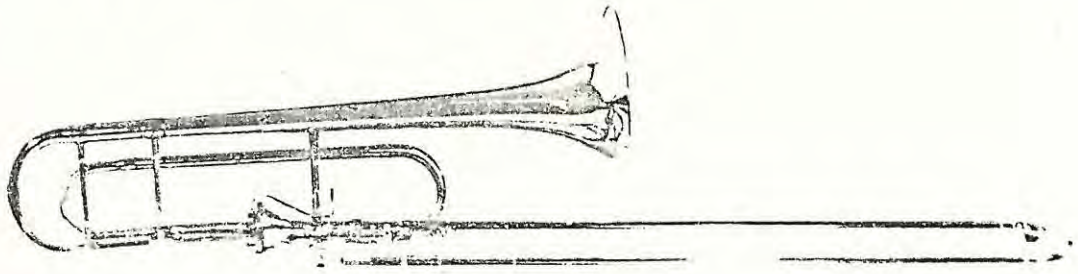
O. Edward Thayer

Enc.

THE REVOLUTIONARY AXIAL-FLOW VALVE

After 5 years in Development and testing, Now Offered to the Discriminating Musician!

Superior Performance in a Trombone Avoids Tortuous Bends in the Valve



Axial-Flow Valve F-Attachment in Tenor or Bass Trombones

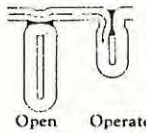
*TONE: The instrument equipped with the Axial-Flow Valve is refined and gratifying. The clear beauty of the natural trombone is retained. Freed of undesirable harmonics, the tone is clean.

*RESPONSE: Quick and sure. The uncompromised fundamental sound wave form is retained allowing a clear centering of the note on a given pitch. The result is a restored pure trombone tone and an uncannily free performance.

*DEFINITION: The natural trombone is capable of producing a well-defined and elegant sound wave. The Axial-Flow Valve preserves that quality. It gives a feeling of precision of pitch and control.

*DYNAMICS: Fortissimo passages are delivered full, round, and solid without the harsh flare of an overblown note. All intensities are delivered with less effort as in the straight horn. This truly responsive instrument allows the performer to direct more of his attention to musicianship and interpretation.

Below is a sectional sketch of the sound path through the *Standard Rotary Valve.*

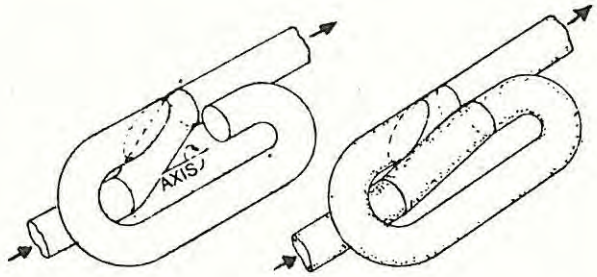


Open Operated

In the open position the sound wave encounters a pair of sharp edges across its path. Between these the bore suddenly changes from round to flat-sided, then leaving the valve, to round again.

When the valve is operated, the sound wave encounters these violations of bore and shape twice. The changes in direction are so sudden and severe that a portion of the wave, in effect, encounters a flat wall almost head on. That portion echos off the wall and reverses direction. This represents a loss of energy in the fundamental wave. It is felt by the player as resistance. The lost portion is now a harmonic out of step with the fundamental. It is heard as a change in tone color, a loss of clarity.

The schematic drawing below illustrates the sound path through the Axial-Flow Valve.



Open Operated

Principle of operation:

The sound enters the rotor at its axis of rotation. The primary passage embodies a gentle offset. It maintains its proper round bore and delivers the sound either to the main bore or, when rotated, to the F-attachment port. When the sound completes its pass through the F-attachment tubing it passes directly through the secondary rotor passage and hence to the main bore. No additional impediment in the operated position is encountered. The F side has the same favorable passage as does the B-flat side!

U.S. Patent No. 4112806
Others and Foreign Pending

Gibson
A Division of Norlin Industries, Inc.
7373 North Cicero Avenue
Lincolnwood, Illinois 60646
(312) 675-2000

November 20,1979

Mr. David J. Galloway
Senior Lecturer, Low Brass
OFS Education Dept.
P.O.Box 521 BLOEMFONTEIN 9300
Republic of South Africa

Dear Mr. Galloway:

This is in reference to your recent inquiry regarding the Reynolds TO-12 which was discontinued several years ago due to a decline in sales.

The valve section was designed only for tenor trombones and will not fit the TO-12.

We have enclosed a Reynolds catalog per your request. However, for your information, the Olds/Reynolds factory closed production on July 13,1979, and the tooling and property have been sold.

We hope this information will be helpful for you.

Sincerely,

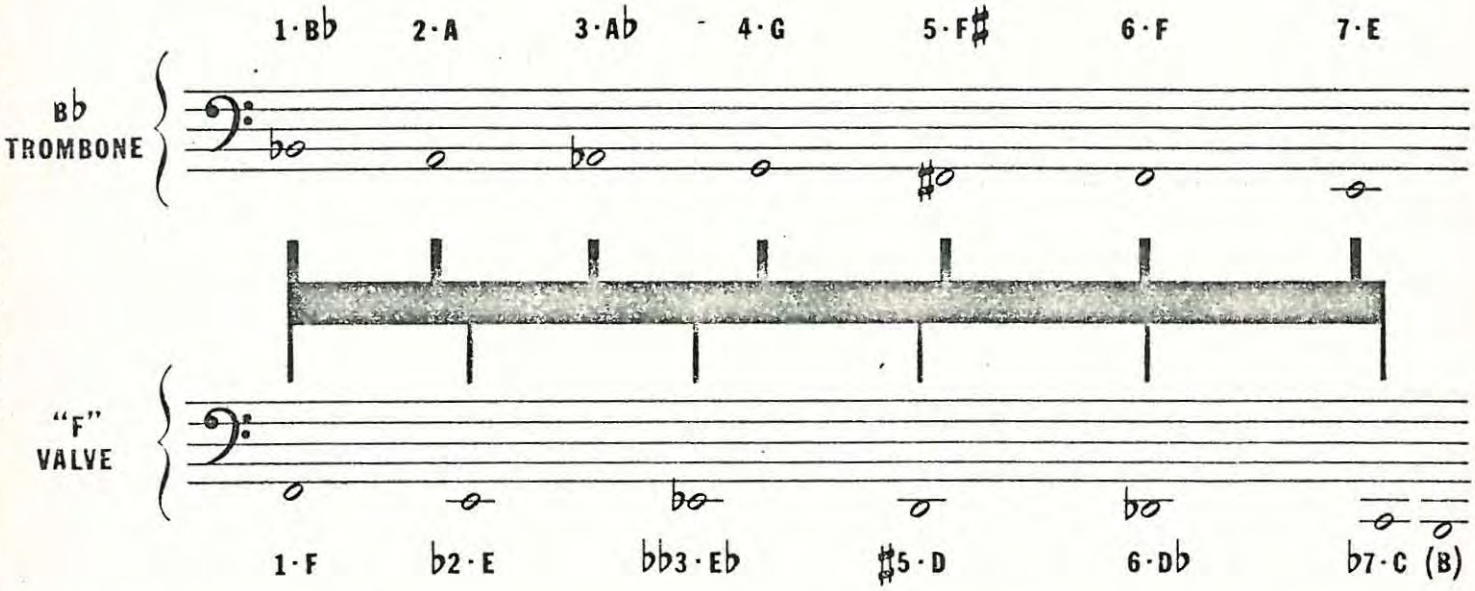
R. C. Daugherty

Mr. Richard C. Daugherty
Manager of Account Sales
Gibson Division

RCD/ls

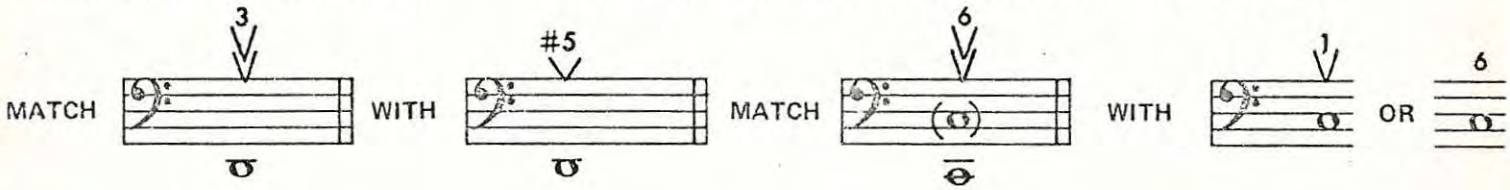
SLIDE POSITION PLACEMENT

(VISUAL FACSIMILE)

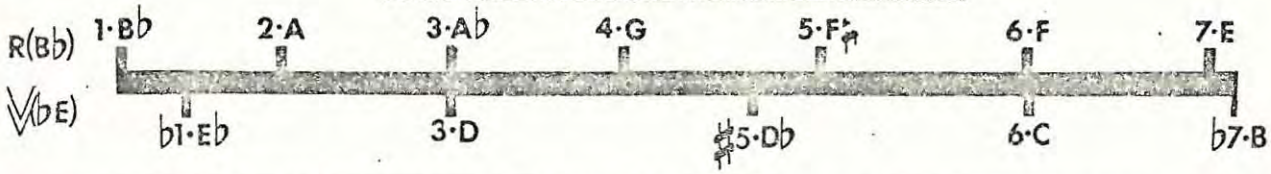


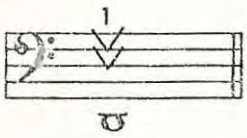
TUNING THE DOUBLE VALVE (bE)

TUNE BY "MATCHING" NOTES . . . . . .



SLIDE POSITION PLACEMENT DIAGRAM





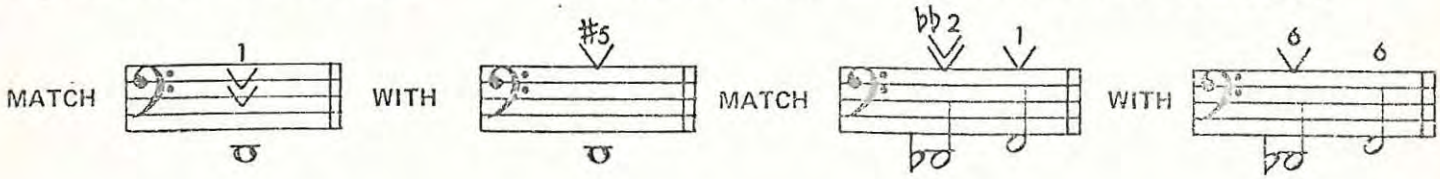
DOUBLE VALVE IN D

Adding the "D" crook tunes the double valve to a D-fundamental in 1st position.

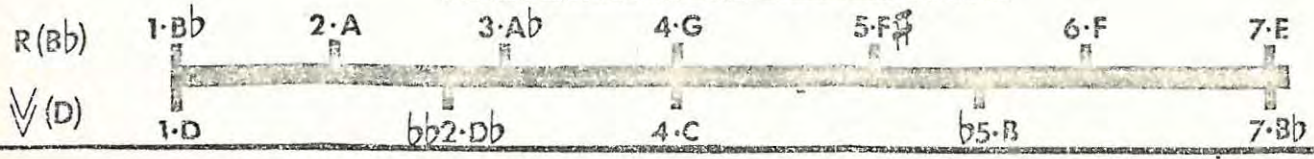
The D tuning of the double valve is the ultimate and recommended tuning. New position placements must be learned as well as valve/slide combinations. (See A. Raph method — C. Fischer pub.)

TUNING THE DOUBLE VALVE (D)

TUNE BY "MATCHING" NOTES . . . . . .



SLIDE POSITION PLACEMENT DIAGRAM



Position Charts courtesy Alan Raph and the King Musical Instrument Company

B A S S O O N S

CHAPTER 1: A PREAMBLE

AS LONG AGO AS THE MEDIAEVAL ERA of the curtal and dulzian, a twin stream of development has been evident in the development of the musical instrument we today call the bassoon. On the one hand, there has been the English/French/Italian branch of the instrument's development, which has reached its logical (some would say illogical) conclusion in the "French" bassoon manufactured by the Parisian firm of Buffet-Crampon today, and widely used in France, Italy and, to a lesser extent, Spain today. This type of instrument will not be discussed in greater detail here, but its inclusion is certainly necessary in order to lend perspective.

The "French" bassoon had -- and still has -- fewer keys than its Teutonic counterpart, a more vocal and less "woody" tone quality and, in spite of its often capricious intonation, enjoys a large measure of support from specialist devotees outside its country of origin.[1]

The other side of the evolutionary coin, as it were, is found in the Bohemian bassoons of Dresden, Graslitz and Vienna which, via Almenraeder, Heckel and others reached their culmination in the German-system bassoons of today á lá Heckel, Püchner, Schreiber, Moennig, Mollenhauer, Conn and Fox. These, in spite of the increasing inroads being made by United States manufacturers into the production of top-rate bassoons, are commonly known as "German-" or "Heckel-system" bassoons.

The nineteenth-century mid-European instruments often displayed a characteristic flat rear section to the long or bass joint (actually, the pre-war Köhlert is typical in this respect), a noticeably broader, darker tone quality compared to their French and Italian counterparts, and generally (though not invariably) superior intonation.

Today, the "state of the art" in manufacturing the German-system bassoon can be found in the top-line models of the manufacturers mentioned above, as well as the East German Adler bassoon which has not been all that accessible to would-be purchasers since 1945 (the celebrated British bassoonist Gwydion Brooke -- son of the composer Holbrooke -- plays a much-modified Adler). There is reportedly a new entry in the bassoon-manufacturing field in the person of Jeremy Soulsby of Hereford who, virtually single-handedly is turning out a limited number of excellent German-system bassoons. He apparently already has a waiting list of some years, and Dr Ron Klimko of the University of Idaho describes the instruments as being "very responsive" as well as possessing a "big and rich tone".[2]

It was undoubtedly one of the Heckel-system's progenitors to which the late Walter Susskind was referring when pointing out that "...certain instruments like the bassoon were louder in Brahms' time -- they were rougher instruments; you find that in Beethoven's era also".[3]

The advances of Almenraeder and Heckel notwithstanding, the allegedly "modern" bassoon is nothing of the sort with its anachronistic keywork; it is a contradiction in terms. Although materials have been improved considerably in post-WW2 times, the bassoon of the nineteen-eighties lags behind the advances of the Boehm-system flute, clarinet and saxophone. William Spencer, American bassoonist and author of **The Art of Bassoon Playing**[4], claims that it has lagged behind in teaching methods and performance, too. "Before WW 2 students of bassoon were dependent on European builders and performer-teachers, and the Almenraeder 1840 vintage instrument was still being used as the model for bassoon construction. Since the late 1940's, American bassoon players have been primarily responsible for refining the old nineteenth-century Heckel system, first in performance, and later in methods of manufacture."

Spencer also lists manufacturers of 6- to 24-keyed bassoons whose combine developments led up to the Heckel system bassoon. In this context he mentions that Almenraeder's well-known **School of Bassoon Playing** was intended for the 15-keyed instrument of his time (1786-1843).

Karl Almenraeder was the son-in-law of Wilhelm Heckel senior, and most bassoonists are thankful that such a fruitful relationship existed when it did, no matter what the Americans say! During a period spanning roughly half a century (1825 - 1875 ca.) Almenraeder vastly improved the existing keywork and the positioning of the tone-holes. He also modified the bore, but in the process coarsened and de-natured the instrument's tone-quality to what was even then considered an unacceptable degree. Cynical bassoonists of the latter half of the twentieth century are fond of adding that it subsequently took the Heckel family **another** half-century to restore the instrument to its former tonal glory[5], but this is only partially true. It is the writer's personal opinion that no-one who started his bassoon-playing activities on an old Hawkes & Son, Boosey & Co., Cabart or other non-Heckel-system is likely to take his modern Heckel, Püchner, Schreiber or Fox for granted!

The process of further refinement was (and still **is**) an essentially ongoing one, although it was felt by many cognoscenti to have reached a peak in the pre-war series 5000 and 6000 Heckels. In any event, the Heckel is still to this day regarded as the yardstick by which all other German-system bassoons are judged. /37

Whether or not other post-Almenraeder manufacturers of German-system bassoons envisaged their product as a deliberate carbon-copy of the Heckel is a matter of conjecture. In fact, it is unlikely; Herrn Püchner, Schreiber, Moennig and **especially** Adler could not have viewed their instruments as quasi-Heckels, given their awareness of the ongoing process of refinement. Spencer[6], by way of illustrating this point, lists a number of innovations in bassoon construction introduced in the industry (main U.S.) since 1920:

1920	Rubber boot cap covering to prevent shock or damage to instrument
1930s	Plateau C key[7], permitting swift action, eliminating key ring (not yet standard)
1937	Lacquer, slightly elastic, to permit expansion and contraction of wood beneath
1947	Sculptured one-piece "monolithic" keys
1948	Tapered swabs for better moisture absorption
1954	Reduced body size to accommodate smaller hands
1955	Tuning slide for plastic school instruments
1957	Rotary hinges instead of lever keys on tenor or "wing" joint
1959	Cork, or plastic tubes, pre-formed for easy replacement or adjustment; tarnish-resistant Rhodium plating
1960	"Space Age" alloy and tempered keys for durability
1965	Rocket wire springs that will not fatigue or rust

1966 Snap lock to hold joints together;

1967 Short bore bassoon; the so-called "American Symphony Orchestra" model, or the type produced by Heckel since the 6000 series(post-1930)

1968 Tuning slide built into the crook

Unlike the trombone (or any brass instrument), the playing characteristics of the bassoon may be expected to vary considerably not only from make to make (which one might reasonably expect) or even model to model, but between two (or more) outwardly identical instruments of the same make and model. It follows that attempts to evaluate various bassoons must be tempered by greater introspection and less rigid categorization than would be the case in a trombone evaluation. In what can for practical purposes be considered the upper octave of its range -- Eb above middle C to the Eb above that -- the bassoon presents its would-be masters with a greater selection of alternative fingerings than any other woodwind.

Indeed, mastery of the bassoon's fingering over the instrument's full working range -- three octaves and a fourth -- is a more daunting task than on any other woodwind. The basic scale of the instrument, F to *f* with a B-natural as the fourth degree, is the only area in which basic "seven-fingers" woodwind fingering obtains, and even this cannot be overblown past middle D. There is simply no such thing as extending the basic first octave fingering into the third octave, or even the upper third of the second octave.

It is in this tenor range where 75% of the solo and orchestral repertoire lies, the famous and exposed solos of Tchaikovsky, Chopin and Brahms, for instance. In this register the player is faced with a fairly complicated set of cross-fingerings, even for diatonic passages in C major. And, as has been mentioned, no two bassoons are **exactly** alike, particularly when it comes to alternative fingerings. Humouring or "lipping" certain notes into tune on one's own instrument becomes a subconscious reflex action, thus playing an identical passage with identical fingering on another bassoon can present problems over and above those already mentioned. Improve the instrument though he did, Karl Almenraeder did not carry the process nearly far enough. Today, in the United States, the work of further refining the bore, key mechanisms and acoustical properties of the bassoon is being carried out by men such as Hugh Cooper, Don Christleib, Paul Lehman, Alan Fox, Jack Linton and Hans Moennig (now resident in North America).

---

1 *An example is the North American Bassoon Quartet, -- all Buffets, although all members play German-system bassoons, too.*

2 *Dr Ronald Klimko of Idaho University, in a letter to the writer.*

3 *Recorded interview with the writer, Cape Town 1975.*

4 *William Spencer: The Art of Bassoon Playing (Summy-Birchard)*

5 *The full details of Almenraeder's work can be found in Chapter 4 of Lyndesay G. Langwill's The Bassoon & Contrabassoon (Benn).*

6 *Spencer: The Art of Bassoon Playing, Part V*

7 *The writer has seen this feature only on a Heckel.* /40...Ch.2

CHAPTER 2: MATERIALS & MECHANISMS

HOWEVERMUCH ONE MAY BEMOAN the seemingly anachronistic condition of the bassoon and its keywork, one should bear in mind that there exist sound acoustical reasons for the instrument retaining many of its "traditional" characteristics. Some highly ingenious attempts have been made by Sax, Boehm, Triebert and Hasenier to improve keywork and intonation. But, as author Wally Horwood puts it, "All the ingenious ideas tried at this time (1851-1862) and later seem to have come to grief because they tended to alter the tone of the bassoon too much to be acceptable."[1]

Horwood succinctly describes the physical problems: "The bassoon had always presented makers with its own peculiar and difficult problems. To get the six primary note-holes of an eight-foot instrument within the span of a hand, early makers drilled them obliquely into the thick walls of the wooden tube."[2] As, of course, do makers today, particularly in the tenor joint. The three holes (C, D & E) for the left hand are -- apart from the ring key on the C -- left plain and unadorned, and the passages are lined with plastic, ebonite or metal tubes. This is not only in order to stop wood-rot caused by accumulated moisture, but to preserve the integrity of the air-passages joining the finger-holes to the main bore, which obviously have a bearing on the intonation.

But let us continue with Horwood's explanation: "(Sax) spent a good deal of time and effort in trying to improve the very imperfect bassoon...As far back as 1820 (he) had been among the first to experiment by drilling in the correct acoustical positions, effecting the operation by means of keys and rods...It was no doubt the partial success of these instruments that prompted the son to continue on the same lines. For the London Exhibition of 1851, he included a brass bassoon with 23 keys (the bassoon of that era would have had at the most 14), which caused considerable interest... Theobald Boehm...examined the instrument closely, and congratulated the inventor.

"Despite the excitement, Sax's construction was not taken up...Boehm was led to collaborate with Triebert in a laterally-bored, key-rod operated bassoon...This was an efficient, but heavy and expensive model; only a few were made...no doubt Sax had other pressing matters on hand, or else felt that Triebert's instrument was ahead of his own conception."[3]

This latter conjecture is highly unlikely, as the Triebert instrument is one and the same with that described by Anthony Baines as "An instrument of unbelievable complexity and utter poverty of tone...fortunately it never caught on."[4] Apparently the instrument performed faultlessly, but on account of its denatured timbre could no longer be considered a true bassoon.

Horwood concludes with the observation that "Although Sax contended that the basic characteristic tone of an instrument is not altered by the material of which it is made, modern opinion is that resonant wood does vibrate in sympathy with the air column, which metal does not and, by enhancing the upper partials, subtly influences the tone colour. Of all wind instruments, this is most applicable to the bassoon, where the thick walls and obliquely bored holes play their part in producing a 'true' bassoon tone...None succeeded in ousting the traditional wood."[5]

Wentzel Schreiber and Sons of Nauheim, West Germany, see the situation as follows: "Of all musical instruments, the bassoon must rank as one of the most difficult to produce. Air pockets, air leaks and wood rot have always been the enemies of the bassoon craftsman and player. Up to quite recently, that is, because now Schreiber (*inter alia*) has succeeded in overcoming these age-old problems.

No.1: Air pockets between wing and boot joint lining and wood. These pockets adversely affect the blowing qualities of the instrument.

No. 2: Rotting of wood caused by penetration of water between metal and wood parts of the wing & boot joints.

No. 3: Air leaks at boot joint caused by old, outdated construction methods."[6]

Schreiber claims to have solved the problem with an epoxy resin named Luraton, which is used as a lining, so that "the bore on the wing side of the boot joint and the wing heart thus becomes a homogeneous whole." 43

This technique is used by all manufacturers today -- even in the cheapest student models -- although the lining material may differ somewhat from one manufacturer to another. In addition, entire bassoons are now made out of plastic materials, the leading name in this regard being Alan Fox of South Whitley, Indiana, U.S.A., who makes all his top models available in either North American curly maple or polypropelene.Although impervious to moisture, polypropelene is prone to warp if carelessly subjected to high temperatures. One of North America's most populat student instruments, the Linton, is made entirely from a modern plastic derivative called Linton-ite; these instruments can immediately be identified by the total lack of "bulge" on their bell joint. The writer has in his possession a Boosey & Co. bassoon of circa 1910-12 on which the tenor joint is made entirely of ebonite (a hard rubber), so the idea is by no means new.[7]

Virtually the only wood used in the construction of contemporary bassoons is hard maple, be it North American "curly" or European. A notable exception is found in the case of the French Buffet, who prefer to use the darker, denser and palpably heavier African Grenadilla. In the past rosewood, sycamore and even pear wood have been used, but are considered too soft by today's standards. Due to the highly competitive world market -- and the continued dedication of today's makers to finding better materials -- one can safely assume that progress will continue to be made in this regard, and somewhat more speedily than in the past.

Internationalism in music certainly extends to the bassoonist and, as William Waterhouse and others have pointed out, this has tended to homogenize regional differences and to impel players (and manufacturers) down an increasingly narrow path.

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1 *Wally Horwood: Adolphe Sax -- His Life & Legacy (Bramley) p.114*

2 *Ibid., p. 115*

3 *Ibid., pp. 114/115*

4 *Anthony Baines: Woodwind Instruments & their History(Faber)p.336*

5 *Wally Horwood: Adolphe Sax -- His Life & Legacy, p.115*

6 *Extract from 1978 catalogue of W. Schreiber & Söhne, Nauheim*

7 *This instrument is also equipped with a brass tuning-slide in the "U" of the butt*

/45...CHAPTER 3

CHAPTER 3: POST-WAR ATTEMPTS AT MODERNIZING KEYWORK

Anthony Baines proffers the view that the fingering systems of the German and French bassoons "differ without giving either a decided advantage."[1] On the other hand, Herr Emil Schamberger, former Solo Bassoon with the Gürzenich Orchestra of Köln stated quite categorically that the bassoon's keywork -- German or French -- was quite antiquated and should undergo a complete redesigning. Mr Ingo Holland, Principal Bassoon with the Cape Town Symphony Orchestra and a former pupil of Herr Schamberger describes how his former teacher had "designed a bassoon keywork in piano-type fashion -- that is,one finger only for any note required. Although much easier to play, however, it would have been much more difficult to build. That is why, I suppose, it never 'got off the ground'. Also, (the firm of) Heckel, who were presented with the plans, didn't see the need to invest a lot of money in a new project while they were producing what was (and still is) the best-selling make of conventional instrument.And the consequences of re-educating teachers, publishing a new tutor for the instrument, etc., etc..."[2]

As it happens, Schamberger's concept for a piano-type keyboard for the bassoon is not unique. Plate 20 of the late Lyndesay G. Langwill's **The Bassoon and Contrabassoon** shows a line drawing of a **Klaviaturkontrafagott** built by C. W. Moritz of Berlin in 1845, and apparently used by bandsmen of the 2nd **Garderegiment** of Foot.[3]

Fingered via a system of fifteen keys and touchpieces, this instrument was warmly recommended by Meyerbeer, among others. Unfortunately no surviving specimen is known.

Argueably the most significant development in keywork in recent times are the efforts of Rumanian bassoonist Gheorg Cuciureanu. At the International Double Reed Society Congress in Edinburgh in 1980, Professor Cuciureanu exhibited an instrument incorporating the results of twentyfive years of searching for practical improvements to the bassoons key system. This was greeted with enthusiasm by all concerned, including Principal Bassoonist with the Orchestra de la Suisse Romande, Mr Roger Birnstingl. He would seem to echo the sentiments of Emil Schamberger as well as the majority of contemporary performers with the comment "We feel...at times the need for someone to carry on where Almenraeder left off."

Mr Birnstingl's report[4] report is of considerable relevance here, as it deals with keywork improvements that are of more than academic interest. "What Mr Cuciureanu has done is to rebuild a Heckel; by using very thin and light keywork on both the original and the added keys he has managed to make all his innovations without any increase in weight; the instrument still weighs less than a modern Heckel. At first glance, this bassoon looks like another, and plays like one too, all the normal traditional keywork being there. And one can play it like one's own. This is not a case of an instrument which

can be played only with special study."

Birnstingl then lists the ingenious interlocking keys and linkages in detail, agreeing that "innumerable difficulties could be made very much easier by having these alternatives."

Some eight months later Alan Fox, who had expressed real interest in the Cuciureanu keywork when first exhibited, had a pilot model available (in maple, not polypropelene) to the bassoon-playing public. Fox will adapt the new keywork to any old bassoon of his manufacture, or build it on a new one. He will likewise make the parts available to anyone who wishes to have the conversion carried out independently (the basic parts cost being $1000). It is possible to add only that portion of the new mechanism that one wishes to have, as all four sets of additional mechanism are discrete, i.e. mechanically autonomous. They consist of:-

a) Spatulas for the right thumb (the E plate is divided into three interlocking portions) to provide alternative fingerings for low C and D (normally fingered with the **left** thumb);

b) A special mechanism that allows for the individual **or** joint opening of the low Eb/Db keys;

c) A low E/F-sharp trill key;

d) An articulated Ab/Bb trill mechanism for the right thumb.

Many legato passages can thus be greatly simplified, particularly in sharp keys. As Professor Cuciureanu himself put it, the bassoon now has the technical possibilities and musical expressions of the flute, oboe and clarinet".[5]

Just as some American manufacturers took the German/ Viennese trombone of the early 20th century and developed it to its logical conclusion, it would appear that the more enterprising U.S. bassoon manufacturers -- blessed as they are in the nineteen-eighties with a burgeoning economy and an embarrassingly strong Dollar -- are likely to put these latest "extensions" of European tradition into practice. For the Americans production of the Cuciureanu bassoon is economically viable, as a letter from Mr Robert Giardinelli to the writer reveals: "In regard to the Fox bassoons with the Cuciureanu keywork, they are not in production, but Mr Fox will make them on special order. He wants one-third deposit with a ninety-day delivery date on this particular model. He can put the keywork on two models of maple finish, the Model II and the Model 201. The Model II sells for $4690 nett and the Model 201 for $5650 nett."[6]

The Kansas City Philharmonic Orchestra's principal bassoonist, David DeBolt, reported in October 1981 that he "was able to play Fox's demonstrator Cuciureanu bassoon and was impressed with the possibilities offered (by the additional keywork). I was also favourably impressed with the tone and response of Fox's light varnished soft maple instrument."[7]

It is sincerely hoped that more manufacturers, both U.S. and European, will see their way clear to offering the Cuciureanu keywork as an option, either in part or in whole. Certainly, the "split" E thumb-plate, offering alternative low D and C fingerings that leave the l.h. thumb free, is desirable.

As has been noted, these extra mechanisms do not add appreciably to the cost of the instrument if incorporated from new, and there is no good reason that at least one or two of them should not become standard equipment on manufacturers' top models. No quantum leap, admittedly, but a tangible and affordable improvement.

A line of research which to some may seem retrospective is currently being pursued by Dr Ronald Klimko, Professor of Bassoon at the University of Idaho's School of Music in Moscow, Idaho, U.S.A. Far from considering the Triebert/Sax/Boehm experiments a lost cause, he is actively pursuing the and resuscitating the concept of Boehm-type fingering for the bassoon, although not in as radical and mechanically cumbersome a form as that of Triebert. Dr Klimko espouses the "double-Boehm" fingering system, which would give Eb and Bb with the fingerings LH | RH ·o·o|ooo and ···|·oo , and E-natural and B-natural with o·o|ooo and ···|o·o respectively. According to a letter from John P. Newhill[8], this system was fitted to the Haseneier Boehm bassoon. Newhill, a clarinettist "who is interested in all woodwind mechanisms", strongly supports Klimko's contention that a simpler form of Boehm system could have been the bassoon's "way out of the dark ages back in 1932", as Klimko put it. Dr Klimko also envisages alternative groupings of keys for the thumbs (á lá Cuciureanu) and little fingers (á lá Boehm), plus a more logically conceived mechanism for high note fingerings -- "perhaps borrowed from the French system."[9]

Dr Klimko also makes mention of a modern Boehm system bassoon built for a Mr Percy Gatz in 1982/3, but further details are unavailable to the writer at this juncture.

Klimko unashamedly advocates "bassoon reform", pointing out that the "economic infeasibility of building a better bassoon for a handful of players in the 19th century" is invalidated in this day and age. He puts forward a strong case for "taking the bassoon out of the nineteenth century", and in the process improving on a basis design (but not timbre) that is 150 years old.

1: ANTHONY BAINES: WOODWIND INSTRUMENTS AND THEIR HISTORY (FABER)
2: LETTER TO THE WRITER, 1981
3: LYNDESAY G. LANGWILL: THE BASSOON & CONTRABASSOON (BENN)
4: ROGER BIRNSTINGL: THE CUCIUREANU BASSOON; THE DOUBLE REED, 3/81
5: REPORT IN THE DOUBLE REED, 12/81
6: LETTER TO THE WRITER, MAY 19TH 1982
7: REPORT IN THE DOUBLE REED, 10/81
8: LETTER IN THE DOUBLE REED, SPRING 1985
9: R KLIMKO: FROM THE BASSOON EDITOR'S DESK, THE DOUBLE REED, FALL 1982

Q U E S T I O N N A I R E

1) What make(s) and model(s) of bassoon(s) do you use in performance?

Of the instruments you have sampled personally, what are your first three choices?
i) reason:
ii) reason:
iii) reason:

2) Do you normally use the crook that "came with the instrument"?
If not, what is your choice (e.g. Schreiber CE 2, &c., &c.)?
Likewise, do you use the standard handrest?

3) What, if any, are your objections to the neck strap (as opposed to the seat strap)?

4) To what extent do you use the low Eb and Db keys as a vent (Schalloch)?

Do you use the keys a) primarily to enhance tone quality; b) to adjust intonation; c) both? (Please underline) At what stage do you introduce this technique to students?

5) With reasonable care, does a reed used professionally last you on average a) less than a month; b) about one month; c) about three months; d) up to six months or more (Please underline). If your answer is (d), what is your secret?

In the maintenance of a reed, what adjustment(s) to the wires do you find most frequently necessary?
Do you consider it good policy to keep the 2nd wire (nearest the crook) as near a perfect circle as possible? Please comment:

6) Do you feel that the modern (German system) bassoon has evolved as far as it is ever likely to in practical terms?
In what areas (e.g. intonation, weight, durability of keywork and materials, &c.) would you like to see the greatest improvements?

Do you see synthetic materials (polypropeline, durlon, ebonite, &c.) featuring more prominently in future bassoon construction?

7) Over and above K 191, K 292 and possibly K Anh 230a, which of Mozart's bassoon passages have impressed you most consistently over the years (from symphonies, piano and other concertos, operas, arias and chamber music)?

Do you consider K Anh 230a to be spurious? Why? (or why not?)

8) What compositions for other solo winds (or even strings) strike you as potentially sounding better on the bassoon than on the original solo instrument?

9) What STUDY material do you use in teaching in addition to Weissenborn and Milde?

10) What questions would you have added to this list (please be frank)?

Thank you for your time. DJG

CHAPTER IV : THE QUESTIONNAIRE

Early in 1981 a questionnaire was compiled in preparation for inclusion in this thesis, and sent out to a number of professional bassoonists known to this writer. While the ten questions posed were of a practical rather than an esoteric nature, the replies were as divergent as they were informative.[1] Herewith the questions, with the various responses received:-

QUESTION 1) *WHAT MAKE(S) AND MODEL(S) OF BASSOON(S) DO YOU USE IN PERFORMANCE? OF THE INSTRUMENTS YOU HAVE SAMPLED PERSONALLY, WHAT ARE YOUR FIRST THREE CHOICES?*

(Comment: Some bassoonists, particularly those of the "Old School", are inclined to be retentive about the equipment they use, and the reasons for using it. The aim here was to elicit a positive opinion).

ANSWERS:

(I.H.)	*1st choice:*	*Heckel (uses Puchner)*	*Reason:*	*Best timbre, especially the 1930/1940 series.*
	2nd "	*Puchner*	*"*	*Next best sound to Heckel, and best intonation.*
	3rd "	*Schreiber*	*"*	*Best intonation after Puchner.*
(C.H.)	*1st "*	*Puchner*	*"*	*Light sound.*
	2nd "	*Heckel*	*"*	---
	3rd "	*Schreiber*	*"*	---
(R.K.)	*1st "*	*Heckel (also performs on Buffet)*	*"*	*Consistency, response, tone quality.*
	2nd choice:	*Soulsby*	*"*	*Big tone, rich, very responsive.*
	3rd "	*Puchner*	*"*	*Freedom of response (TOO free compared to Heckel).*
(G.P.)	*1st "*	*Puchner*	*"*	*Tone, consistency (though sharp in low register).*
	2nd "	*Schreiber*	*"*	*Bright sound; good for 1st bassoon*
	3rd "	*Adler*	*"*	*Popular student bassoon in U.K.*
(J.B.)	*1st "*	*Buffet (35K)*	*"*	*Devotee of French bassoon.*
	2nd "	*Cabart*	*"*	*Good student " "*
	3rd "	---	*"*	---
(D.G.)	*1st "*	*Puchner (uses Schreiber)*	*"*	*Superior tone quality & intonation*
	2nd "	*Schreiber 5080*	*"*	*Excellent sound; more than acceptable intonation.*
	3rd "	*Fox Cuciureanu*	*"*	*Excellent reports.*

CONCLUSIONS:

i) The famous Heckel is by no means accepted as "the last word" by all concerned. The Puchner, though felt by some to have more reliable intonation than the Heckel, is acknowledged to be slightly sharp in the low register.

ii) The Schreiber is a consistent second or third favourite, both the bright-sounding 10, 20 & 70 series, and the darker 80 series.

iii) The French bassoon —though obviously outside the scope of this thesis —is alive and well, in specialist hands.

iv) The actual range of instruments used(or even sampled) remains remarkably small.

/Q.2

QUESTION 2) *DO YOU NORMALLY USE THE CROOK THAT COMES WITH THE INSTRUMENT? IF NOT, WHAT IS YOUR CHOICE? DO YOU USE THE STANDARD HANDREST?*

(Comment: As discussed at the end of the following chapter, the crook — or bocal, as it is called in North America — is a variable item of ancillary equipment that can dramatically alter the playing characteristics of any bassoon.
The handrest issue is one of personal taste.)

ANSWERS:

(I.H.) *Yes, standard crook(but one selected from a choice of 50)& handrest.*

(C.H.) *Yes, standard crook; no, no handrest.*

(R.K.) *Heckel 2CC nickel plated crook; no handrest.*

(G.P.) *Puchner CC3(CC2 is standard); standard handrest.*

(J.B.) *Buffet crook, slightly longer than standard. Handrest not applicable to the French bassoon.*

(D.G.) *Standard Schreiber KE2; occasionally KE3 in hot weather. Standard handrest.*

CONCLUSIONS: Only slight deviations from standard crooks are evident, but the handrest issue is distinctly polarized.

QUESTION 3) *WHAT, IF ANY, ARE YOUR OBJECTIONS TO THE NECK STRAP (AS OPPOSED TO THE SEAT STRAP)?*

(Comment: The bassoon's weight distribution remains a problem in terms of the player's comfort.)

ANSWERS:

(I.H.) *No objections.*

(C.H.) *Excessive weight on the left hand (uses seat strap).*

(R.K.) *I use the peg (and much prefer it) both standing and sitting. With the seat strap the angle of entry of crook/reed is not always best. I prefer the neck strap to the seat strap.*

(G.P.) *Prefer neck strap, in spite of slight tension in left arm. The choice, as in all aspects of equipment selection, is very personal.*

(J.B.) *Neck strap definitely fatiguing; but no experience of seat strap.*

(D.G.) *Standard sling too narrow for comfortable weight distribution on neck, but problem solved by using a much wider band at the top.*

CONCLUSIONS:

The answer appears to lie in a modified version of the neck strap. The seat strap is simply a wide band of leather attached to the butt of the instrument, which the player sits upon. It is obviously of no help when standing up.
The peg referred to by R.K. is a device developed by Mr William Waterhouse in the U.K., similar to the bass clariner peg. Its use normally requires modification of the angle of the crook.

QUESTION 4) *TO WHAT EXTENT DO YOU USE THE LOW Eb AND Db KEYS AS A VENT (SCHALLOCH)? DO YOU USE THE KEYS PRIMARILY*

a) TO ENHANCE TONE QUALITY ABOVE MIDDLE C?
b) TO ADJUST INTONATION?
c) BOTH?

AT WHAT STAGE DO YOU INTRODUCE THIS TECHNIQUE TO STUDENTS?

(COMMENT: Of all "modern" woodwinds, the technique of "venting" is peculiar to the bassoon. There has been comparitively little written on the subject to date,and utilization of the technique varies considerably from one "school" of playing to another.)

ANSWERS:

(I.H.) *Both reasons; introduced as soon as possible to students.*

(C.H.) *Uses Eb key to stabilize intonation of upper E(otherwise sharp) and middle Eb on Puchner.*

(R.K.) *1) Eb key for everything above Eb to top register; 2) Eb key for middle G; 3) Db key for Eb fork fingering. Uses keys for both reasons; introduces technique to students right away.*

(G.P.) *Aid to intonation on G, e and f; to stabilize Eb, and to ease production of extreme high register from high Bb upwards. Admittedly not a "great fan" of alternate fingering.*

(J.B.) *Eb key extensively used.*

(D.G.) *Extensively above middle C (all notes except C sharp, E natural and D). Used for both reasons. Introduced after first two terms.*

CONCLUSIONS: Venting of the tenor and upper register notes is common practice, varying only in slight detail due to the peculiarities of a particular instrument. It is taught as part of regular technique from shortly after the beginner stage, or earlier.

QUESTION 5) *WITH REASONABLE CARE, DOES A REED USED PROFESSIONALLY LAST YOU ON AVERAGE a) LESS THAN A MONTH; b) ABOUT ONE MONTH;*
c) ABOUT THREE MONTHS; d) UP TO SIX MONTHS OR MORE?
IF YOUR ANSWER IS d), WHAT IS YOUR SECRET?

(COMMENT: These specific time periods were chosen as a result of the writer's own experiences with reeds of varying quality. The final question is not intended to be capricious, but is an attempt to elicit some terse, practical hints on the subject of reed maintenance.)

ANSWERS:

(I.H.) *Makes own reeds, or modifies Hombachs:"It takes hours of practising and several rehearsals" until a reed is "blown in"; thereafter a good reed will last "six or eight performances plus a general rehearsal." "A new reed is never satisfactory in terms of sound."*

(C.H.) *Varies considerably.*

(R.K.) *About one to three months, but sometimes six or more. The secret is to have a lot of reeds and rotate them. Tightening of the wires sometimes necessary in a dry climate. Considers it good policy to keep 2nd wire(nearest the crook)more round than oval, although an over-round shape is found to inhibit vibration.*

(J.B.) *With infrequent use (not a fulltime player) six months or more. Round 2nd wire has a beneficial effect on tone with French-type reeds.*

(D.G.) *About three months, but in exceptional cases up to a year or more! 1st wire requires manipulation to taste in virtually every reed; near-circular 2nd wire aids vocal quality of tone, but overall quality of cane is ultimately the deciding factor all round.*

CONCLUSIONS: Two to four months of professional playing would appear to be the average. Players all have individual ways of modifying a good "standard" reed(usually imported from Germany) to suit their needs.

QUESTION 6) *DO YOU FEEL THAT THE GERMAN BASSOON HAS EVOLVED AS FAR AS IT IS LIKELY TO IN PRACTICAL TERMS?*
IN WHAT AREAS(e.g. INTONATION, WEIGHT, DURABILITY OF KEYWORK AND MATERIALS, &C.) WOULD YOU LIKE TO SEE THE GREATEST IMPROVEMENTS?
DO YOU SEE SYNTHETIC MATERIALS FEATURING MORE PROMINENTLY IN FUTURE BASSOON CONSTRUCTION?

(COMMENT: This was a deliberately provocative and difficult question)-

ANSWERS:

(I.H.) *I do not think that synthetic materials will ever completely replace the wooden instrument, but they might be found more often in future because of the rarity of suitably seasoned wood. The keywork is totally antiquated...(here followed the account of Schamberger's work)*

(C.H.) *Has not yet fully evolved. Would like to see improvement in intonation. Does not see increased usage of synthetics.*

(R.K.) *Answer to first part of question: "NO — NEVER! Want to see Boehm-like fingering modifications, removal of forks, alternate thumb keys, &c." Sees increasing use of synthetic materials.*

(G.P.) *Believes makers will strive to improve intonational problems. Would like to see a more lightweight instrument, but acknowledges that a certain thickness of wood is necessary for traditional tone quality. Suggest the "plastic" bassoon useful as student instrument because of durability, though not the same sound as a wooden instrument.*

(J.B.) *Comments that the standard of materials and workmanship has dropped in recent years, even among "prestige" makers. Does see increasing use of synthetics.*

(D.G.) *German bassoon has not really reached end of evolutionary process. Improvement necessary in areas of intonation and quality of materials. Sees increased use of synthetics primarily in student instruments.*

CONCLUSIONS: The consensus is that the development of the Heckel-type instrument has by no means reached its logical conclusion, and that developments in improved intonation, craftsmanship and key systems are eagerly, even impatiently awaited. Polypropelene and other modern synthetic materials are here to stay, albeit in a subsidiary role.

QUESTION 7) *OVER AND ABOVE KV. 191 and 292, WHAT EXAMPLES OF MOZART'S BASSOON WRITING HAVE IMPRESSED YOU MOST CONSISTENTLY OVER THE YEARS?*

(COMMENT: Mozart was a professed lover of the bassoon, and most bassoonists return the compliment.)

Works specifically mentioned in response to this question were:

The Piano Quintet, KV. 452 (two responses)
The "Jupiter" Symphony (No. 41) KV.551 (two responses)
Symphony No. 40 in G minor, KV. 550 (two responses)
Cosi Fan Tutte
The Wind Serenades (two responses)

More generally referred to were:
The slow movements of the piano concertos (four responses)
The late operas (two responses)
The slow movements of symphonies (three responses)
The orchestral dances

CONCLUSION: A deep affection for Mozart's bassoon writing — and, indeed, for his wind writing generally — is evident here. The bassoon concerto KV. 191 remains a perennial favourite among players of all calibres.

The "second" Mozart bassoon concerto, KV. Anh. 230a, is now known to be the work of DeVienne (Vienne Le Jeune).

QUESTION 8) WHAT COMPOSITIONS FOR OTHER SOLO WINDS OR STRINGS STRIKE YOU AS POTENTIALLY SOUNDING BETTER ON THE BASSOON THAT ON THE ORIGINAL SOLO INSTRUMENT?

COMMENT: Again, a deliberately provocative question, as bassoonists are known to be always searching for additions to their repertoire

Composition specifically mentioned were:

J.B. Senaille--Introduction & Allegro Spiritoso
W.A. Mozart--Violin Sonata No.21 in e min, as transcribed and recorded by Gwydion Brooke
Rimsky-Korsakov--Clarinet Concerto (transcription)
C.M.Weber--Clarinet Concertino Op. 26, transc. S. Kovar
Percy Grainger--La Scandinavie (orig. 'cello)
Stephen Dodgson--certain small-scal contemporary flute and 'cello compositions.

CONCLUSION: Not all bassoonists replied to this question; some frankly admitted to never having given the subject much thought. This is paradoxical, as bassoonists are by no means satisfied with their "wealth" of literature.

QUESTION 9) WHAT STUDY MATERIAL DO YOU USE IN TEACHING IN ADDITION TO WEISSENBORN AND MILDE?

COMMENT: These two composers of studies for the bassoon are the "staples" of traditional methodology, but many useful alternatives exist

ANSWERS:

I.H. *Weissenborn and Milde are the best and should be sufficient. For the more advanced, "virtuoso" student, one example is Orefici's Studi de Bravura (Ricordi)*

C.H. *Ozi; Gampieri*

R.K. *Jacobi Caprices; Gambaro Studies; Bianchi Studies*

G.P. *Piard: 16 Characteristic Studies*

J. B. ——

D. G. *Pederson: Advanced Studies for Tenor & Bass Trombone (Schmitt)*

CONCLUSION: It is puzzling and slightly vexing to the writer that material such as the very well-known studies by Gatti, Marcel Bitsch, C. Kopprasch, or Simon Kovar's 24 daily Exercises, Leo van de Moortel's or Karl Pivonka's Studies, or even the more contemporary **Progressive Bassoon Studies** of Victor Bruns, **Das Fagott** by Gunter Angerhöfer and **10 Modern Studies** by Otto Oromszegi were not even hinted at, let alone mentioned or used. If nothing else, the occasional use of some of these additional methods would make the student's life more interesting!

/57...Question 10)

QUESTION 10) WHAT QUESTIONS WOULD YOU HAVE ADDED TO THIS LIST?

J.H.	*More questions on teaching method*
C.H.	*What type of vibrato -- diaphragm or throat*
R.K.	*Do you encourage students to take other instruments or voice as well?*
G.P.	*Encourages additional reading on the subject of the bassoon*
J.B.	*Would need to know better the aim of this survey!*
D.G.	*What type of vibrato (Diaphragm or jaw); do you make your own reeds and why (or why not)?; what other instruments do you play?*

CONCLUSION: The somewhat controversial and "non-standardized" area of **vibrato** on the bassoon is a concern here. Reed-making, though obviously not within the scope of the Questionnaire, was an inevitable question, as was teaching methods[2]. The possibility of doubling is raised.

Overall, this Questionnaire brought to light a useful cross-section of information and opinion. The pattern that emerges is one of extreme dedication to what is an acknowledgedly demanding but extremely rewarding instrument, and a live interest in the search for meaningful improvements to its mechanism. An anomaly is the strangely conservative approach to the instrument's published literature, both in the area of study material and accompanied (or unaccompanied) solos.

1: Although unknown to this writer at the time, an independent and quite dissimilar questionnaire, which resulted in the publication of BASSOON PERFORMANCE PRACTICES AND TEACHING IN THE UNITED STATES & CANADA, had been circulated in North America by Dr. Ronald Klimko of Idaho University. Dr Klimko, who is in addition bassoon Editor of The Double Reed, was good enough to complete the writer's questionnaire, and provided a good deal of extra information into the bargain.

2: It is the writer's intention to circulate a wider-ranging questionnaire -- dealing specifically with teaching methods and practices in South Africa -- within the foreseeable future.

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CHAPTER V: THE PRODUCTS OF SOME MAJOR MANUFACTURERS INDIVIDUALLY CONSIDERED

1) WILHELM HECKEL & SOHNE, Biebrich-am-Rhein.

Among musicians the saying goes that a Heckel bassoon -- like money -- performs as well or as badly as the individual handling it. At worst, its sound can be unpleasantly heavy, "woody" or "tubby", throwing a lightly-textured woodwind quintet out of balance, and capable of making even Mozart's hornlike parallel sixths and thirds sound wooden and pedantic when played on a pair of over-ponderous Heckels. The insensitive playing of this instrument, compounded as it occasionally is by the use of an unnecessarily hard reed and/or excessive vibrato, must surely be the antithesis of what Wilhelm Heckel Snr. had in mind!

Thankfully, the other side of the tonal coin is by far the commoner one. In terms of tone quality throughout the range, responsiveness to the player's efforts and -- especially -- intonation, the Heckel is the most consistent, predictable and reliable of all instruments on the market, and will deliver excellent results even in the hands of an unseasoned player. And even with an over-soft reed (as is occasionally used by certain recording artists), the Heckel remains true to type -- albeit with some reduction in its usually generous volume.

One of the Questionnaire respondents, Glyn Partridge of the Cape Town Symphony Orchestra, writes "I'm quite sure the most beautiful bassoon I ever played was a "classic" 1930's Heckel belongingto Kerrison Camden. You breathe in one end and music comes out of the other. Martin Gatt had one from the same period."[1] These immediately pre-war Heckels remain very much sought-after, and can change hands for upwards of $7 500!

Clearly, there is a distinct preference for these "classic" Heckels of the 5000 and 6000 series by professionals "in the know" and with the necessary funds at their disposal. This period of construction seems to coincide with Heckel's change-over from what is termed a "long-bore" instrument to their early "short-bore" bassoons. The long-bore instrument is reputed to possess a somewhat darker sound, although it is less suitable for the exposed solo passages found in the orchestral repertoire. Thus, the "classic" Heckels could be among the last of the long-bores, or among the first of the short-bores; further investigation is needed here.

In addition, there are a number of Heckels of around this period that were made with what can best be described as "quasi-French" fingering for the left thumb. Although a full Heckel in every other respect, the French illusion is heightened on these models by leaving the tip of the bell unadorned with the "traditional" (for the German system) ivory ring, being finished with the simple wire or metal ring that typifies the French bassoon bell. The writer has played such a Heckel, belonging to Dr John Juritz of Cape Town.

To be realistic, one should take into account that the purchase of a new Heckel is unlikely to be considered by the majority of music-teaching institutions, who can buy half-a-dozen good Schreiber model 1012's for the price of one Heckel, not to mention the waiting list. A student would likewise need to have an exceptionally affluent background in order to study on a new Heckel. It follows, then, that one may draw an analogy between a good, well-maintained "pre-owned" Heckel, and an SSK Mercedes or 3-litre Bentley: all represent a first-class investment to the owner who is capable of getting the best out of it. Heckel contrabassoons are equally highly prized, and acknowledged as being the best of their kind.[2]

Undeniably, the name of Wilhelm Heckel has become a legend to the bassoonist. If not the proverbial Legend in His Own Time, this was because the Age of the International Bassoonist had yet to arrive. What were jealously guarded secrets even a generation ago are now freely and enthusiastically disseminated among today's players. One such example of "The Old School" in this regard was Simon Kovar, once the doyen of bassoon teachers in the U.S.A. David T. Borst of Indiana University relates: "As a young student the darkest mystery and best kept secret by professional bassoonists was the art of reed making. Often I would come to a lesson with a reed in dire need of adjustment. Mr Kovar would take my reed, and turn his body away so that I was unable to observe what adjustments he was making. When finished, he would return the reed to me without comment...many concepts and techniques practiced by leading bassoonists were unavailable unless one had the privilege of studying with them." "Today the bassoon student has an opulent source of printed material that was not available 25 years ago..... The changing role of the teacher has evolved from a reluctant purveyor of highly guarded secrets of the trade, which were previously handed down from generation to generation by word of mouth, to a 'resource person' with an attitude of willingness to share trade secrets and innovations with all who are interested."[3]

Indeed, publications such as **The Double Reed**[4] bear witness to the cameraderie that now exists between bassoonists worldwide, from the U.S.A. to communist China.

2) JOSEF PUCHNER, Nauheim

This famous firm, generally ranked second only to Heckel in excellence (though many owners of pre-war Adlers would doubtless contest this), has been producing bassoons and contrabassoons since just before the turn of the century; 1897, to be precise. Although manufactured in somewhat smaller numbers than Heckel's (and certainly Schreiber's) instruments, the Puchner bassoon has carved its own very substantial niche on account of its consistency of response and intonation, and relatively full timbre.

In spite of being what one might term a "large bore" bassoon, the Puchner has a distinctly lighter, less "woody", more flexible and, to some, smoother tone quality than the Heckel. Some prominent players frankly prefer the Puchner's timbre, while admitting the Heckel's superiority in intonation. Indeed, many find it preferable to the Heckel as an all-round instrument, performing as it does with equal musical efficacy in symphonic, chamber music or solo arenas.

While the Puchner bassoon's keywork is perfectly "standard German system", it has a rather wider than average "feel" to it, particularly in the area covered by the left hand. This could conceivably cause a temporary problem to the younger student with small hands, particularly if they have begun their tuition on one of the Fox or Linton models designed for small hands. However, the Puchner is a highly responsive and gratifying instrument to play, capable of reproducing the most subtle interpretation and nuance in the hands of an experienced player. A tendency toward slight sharpness on the low G and other notes in the lowest 6th of the range may be experienced, but this is usually remedied by pulling out the long joint a centimetre or two.

The Puchner is also very sensitive to changes of crook but, by the same token, tends to be more responsive than others to alternative fingerings in the uppermost octave, where it exhibits a free, vocal quality not found in any other bassoon except perhaps a good example of the large-bore Schreiber model 5080 or 5081.

A new Puchner bassoon can be imported to South Africa for approximately two-thirds the price of a new Heckel, and within a considerably shorter period of time! The factory's latest development is an addition they call their "Intermediate" model, created primarily for the American market. In fact, Walter Puchner -- fourth generation of bassoon-builders in Nauheim -- visited the U.S.A. in 1985 for the launch of the new "Premiere", as it is called, as well as promoting the Cooper model Puchner, which is the Lewis Hugh Cooper-modified version marketed in the U.S.A. There is also a Puchner contra-bassoon, produced in relatively small numbers, that is almost as highly esteemed as the Heckel.

3) WENTZEL SCHREIBER & Söhne, Nauheim

Schreiber, a comparitive newcomer to this highly specialized industry, has been building bassoons and contra-bassoons since 1946. These instruments have become world-famous as a result of two principal properties: an open, free tone and response (tending towards brightness in the upper register), and exceptionally good value for money. There is currently no waiting list other than for the large-bore 5080 and their excellent contrabassoon and their popularity with students and educators alike remains unquestioned.

The least expensive among the student models is the 5010; an excellent instrument that will see the student through to the end of his or her tertiary education. Some early models had a tendency towards a sharp middle A (and sometimes Bb), but his appears to have been cured. Well worth the small premium is the slightly higher-price model 5020 which has a hard rubber lining to the fingerholes; it is the student bassoon without a peer.

The slightly larger-bore models 5080/81 possess a very warm tone quality, with fractionally less brightness in the upper register and possibly more consistency in the medium and low registers, compared to other Schreibers.

After playing extensively on the writer's model 5081, a professional player pronounced it "the closest thing yet to a Puchner!"[5]

By and large, this range of bassoons would appear to be the most accessible by far to South African purchasers, due to the firm's active -- even aggressive -- export policy. Prices may vary considerably from one retail outlet to another, but are generally some 20% to 30% lower than those of the equivalent Puchner model.

Mention needs to be made of the excellent Schreiber contrabassoons which, like the Heckel, are available with a long bell taking the range down to contra A -- the lowest note on the piano keyboard. The standard model descends to BBb (double B-flat). These are remarkably easy instruments to play and, with the right German-type reed, are capable of producing a truly generous volume of tone, and with good intonation.[6]

4) OTHER GERMAN-SYSTEM BASSOONS

Gebrüder Mönnig, Markneukirchen, have a good bassoon in their top model, although the small bore of the instrument and crook limits the volume of sound considerably. Quality of timbre is good but somewhat lacking in character. In order to produce an acceptable volume, the player has to work hard against the extra resistance in a situation which can hardly be described as energy-efficient. An original (but no longer unique) feature is the incorporation of both the low Bb **and** B-natural keys in an elongated bell joint which, in turn, allows the long joint to be less so, allowing a more compact carrying case. The lowest-priced student model, though basically the same design, suffers from a very poor finish and mediocre workmanship.

/64...Mollenhauer

G. Mollenhauer, Cassel. This West German firm exports the majority of its output to the U.S.A., although it has recently established contact with a small number of dealers in South Africa. The instruments are generally of good quality, with a somewhat different "feel" to either the Heckel or the Puchner. Mollenhauer is perhaps best known for their contrabassoons, and in the U.S.A. their "Lyndsey" model contra is the Heckel contra's most serious contender.

Artia, Czechoslovakia. This instrument deserves mention simply because it is so widespread as a student instrument in South Africa, the result of an aggressive marketing campaign by the U.K. agents rather than any intrinsic musical (or other) value. The basic design is that of the pre-war Graslitz bassoon -- which is good -- but mass production, mediocre (at best!) quality control and the inferior material available in that Socialist country have combined to reduce this bassoon to a parody of what it **should** and **could** be. The writer has tried Schreiber, Conn, Boosey & Hawkes and even French crooks on an Artia bassoon, and even with the very best of reeds the instrument remains recalcitrant. One might have to sample upwards of two dozen of these mass-produced instruments before finding one that is tolerably good; as far as a student instrument is concerned, the Artia is an example of what our Afrikaans-speaking colleagues mean by the expression *Goedkoop is Duurkoop*.

Boosey & Hawkes, Edgeware. It has been fashionable in the past among owners of more exotic merchandise to refer to the B&H Imperial and Edgeware bassoons in terms less than glowing; possibly lacking in respect, or sometimes downright pejorative. That some examples **have** in fact earned this reputation is undeniable. But, furnished with the **right** crook and a well-made reed, the B&H bassoon can actually perform quite creditably, even in the hands of a young student. It has a tone quality that is better than average among instruments in its price range (and there are not many), but the finish varies considerably from one example to another, as does the intonation. Some Edgewares have a C (below middle C) and sometimes D as well, that is so sharp that a special reed is required to at least partly remedy the defect. Yet,the rest of the instrument is usually quite respectable, apart from the occasional middle A and/or Bb that can be difficult to "centre". Compared to the Artia mentioned in the previous paragraph, the B&H can do little wrong. Although lacking the singing tone of the student Schreiber in the upper register, a **good** B&H is well worth considering as a student bassoon.

Hsinghai, Beijing (Peking), communist China. From the People's Republic comes this very creditable imitation of the Schreiber, reputedly widely used in the Far East (both communist and non-communist). Up until early 1984 this instrument retailed in South Africa at the unbelievable price of R795, such were the rates of exchange!

Lark, Shanghai. Another product of mainland China, the Lark bassoon has been described as a fairly good imitation of the Moennig, complete with low B-natural on the bell and compact case! In South Africa, the Lark brand name has, unfortunately, been associated up till now with very basic quality string and brass instruments. Yet Californian bassoonist George Longano, after a visit to communist China, described both the Hsinghai and the Lark as "good instruments", the former being supplied with a fingering chart (in Chinese) that takes the range up to high G on top of the treble stave.[7]

Mirafone, West Germany & California. Although Mirafone (Miraphone in W. Germany) have been producing woodwinds since the late 1940's and bassoons since the late fifties, it is only of late that the Mirafone bassoon is enjoying any prominence. Priced roughly midway between the Schreiber and the Püchner, the new model bassoons are apparently finished off and distributed from the factory in Valencia, California. Up until now, the best known Mirafone products among symphonic musicians have been their excellent CC and BBb rotary-valve tubas, and their genuine contrabass trombone (with four parallel slide branches), which are assembled and marketed in the U.S.A. from their Sun Valley factory in California. But they are of the opinion that they have a competitive product in their bassoon, and it is being aggressively marketed.

Conn, Elkhart, Indiana. Conn was the first U.S. manufacturer to go into production on the bassoon, and such was the excellence of these products from the start, that they caused a noticeable drop in the numbers of European instruments being imported into America at one stage. Conn utilizes some extremely sophisticated equipment in the manufacture of their bassoons, equipment that would not be economically viable in a smaller company. Their materials have always been first class, too. Yet the Conn has a timbre all of its own; not typically German, possibly a infinitesimal part French, but with a very "open" sound throughout most of its range. There is an American bassoon sound, and in some ways the Conn typifies this. There is a "professional" model and a student model, the latter very similar to the former in all but finish and price.

Linton/Armstrong, Elkhart, Indiana. Jack Linton and Son are among the pioneers of the all-plastic bassoon in the U.S.A., and the Linton bassoon (now called and marketed by Armstrong) is exceptionally popular in that country as a "first" student instrument. There are three models, with 21, 22 and 23 keys respectively, all made entirely from Durlon, a patented material (the body, that is). Two models incorporate some sort of aid to small hands, such as a plateau C, additional trill keys, and 10 rollers (four on the cheapest model). A tuning slide is built in. As noted earlier, these bassoons are immediately identifiable by their absolutely straight, bulge-less bell joint, and somewhat sleek black plastic finish.

/68

Fox, South Whitney, Indiana. Hugo and Alan Fox must be regarded as two of America's great innovators in the field of further refining the Art of Bassoon Making. The Fox bassoon programme has top models which vie with the current Heckel in popularity and excellence,[8] as well as all-polypropelene "compact" models specifically designed for small hands. Plus a large number of very interesting models in between, in both maple and polypropelene. In short, Fox offers the full spectrum. As mentioned in an earlier chapter, Fox will build the Cuciureanu keywork onto two of its maple models.

It is interesting to note that Fox has been building both long- and short-bore models since 1951, and refined both models considerably in the intervening years. Fox claims to have a definitive version of the long-bore bassoon in production now; the timbre is reputedly on the dark side and it is pitched two or three cycles/second lower. Not an instrument for the first player in a large symphony orchestra, but an instrument that beginners are likely to find easier to manage and to play in tune.

/69...Footnotes

1: Letter to the writer, 1982

2: A Heckel contrabassoon with range to low A, which the writer has played, is owned by Dr Juritz

3: David T. Borst: The Changing Role of the Bassoon Teacher, May 1978

4: Journal of the International Double Reed Society, East Lansing, Michigan, USA

5: Mr Charles Howell, then of the CAPAB Orchestra, Cape Town, himself a Püchner devotee

6: The writer had fairly extensive experience of such an instrument belonging to the University of the Orange Free State, Bloemfontein. A fairly hard Hombach contrabassoon reed was used

7: Article in The Double Reed, Spring 1982

8: In Dr Ron Klimko's questionnaire, it was revealed that out of 138 North American bassoonists interviewed, no fewer than 111 performed on Heckels (these were further subdivided into series), while 9 played a Fox and 6 a Puchner.

CHAPTER 6: ANCILLARY EQUIPMENT

Whereas it is the mouthpiece that is most capable of influencing the playing characteristics of a brass instrument, in the case of the bassoon it is not only the reed but the **crook** -- bocal in the U.S.A. -- that has the largest influence on the instrument's playing characteristics. It should be noted that virtually all first-line bassoons come equipped with three crooks, **not** of different playing characteristics or favouring different parts of the range, but merely as a tuning device. The"traditional" bassoon does not have a tuning-slide as such (although the contrabassoon does), and the three crooks supplied are of different lengths, while maintaining the correct **taper** for that make or model.

Heckel makes over a dozen varieties of crook, many of which are used by players of **other** bassoons. In addition to the variations in length, there are variations in wall thickness (the "D" variety) and a smaller tip ("B"), the latter reputedly delivering an excellent high register. The Heckel CCV crook is also designed to facilitate the upper register. By far the most widely used are the "CC" series crooks, which have a normal bore and wall thickness, and the newer "C" series, which retain the normal bore, but are slightly lighter in weight. Most of these are available in up to five different lengths: 0, 1, 2, 3 or 4, 0 being the shortest. The writer's Schreiber came equipped with a no. 1, 2 and 3, the latter being called for occasionally in the course of a Natal summer.

There are a number of specialised woodwind firms making specialised crooks for a specific purpose or to remedy some problem, real or imagined. Virtually every basoonist has at least one "gimmick" crook, even if it is just a "spare" from another instrument. Many student owners of mediocre bassoons obtain improved results with a Heckel, Puchner, Schreiber or even the smaller-bore Moennig crook. French crooks can be used on German-system instruments,and vice versa. One specialist crook manufacturer is Allgood of Kalamazoo, Michigan, whose bocals are "expressly designed for ease of response in the extreme high register of the bassoon", and sell for $160 apiece.

In the nineteen-fifties Conn used to manufacture a crook made of red brass -- "Coprion", they called it, no doubt due to the higher copper content and the appearance -- rather than ordinary yellow brass (which has less copper and more zinc) or nickel silver. This crook was actually supplied as standard with their bassoons at the time, but is unfortunately no longer in production. Their current nickel silver models have been found effective by the writer in "opening up" the octave above middle C on some instruments, although it affected the intonation of some notes immediately below middle C. Other crooks of U.S.A. manufacture which enjoy a measure of popularity are those of Polisi, MacGibbon and Linton, all manufacturers of the complete instrument in years gone by.

The relationship between player, instrument, crook and reed is a delicate one, additionally influenced by ancillary factors such as the hand-rest (or lack thereof) and the way the instrumented is supported or suspended via the seat or neck strap. Mr Ingo Holland, principal bassoon of the Cape Town Symphony Orchestra, sums up the situation with these words: "I personally believe that one cannot become a first-class bassoonist unless five factors blend harmoniously:

1) Your own physical makeup and condition;
2) Your schooling, especially regarding embouchure;
3) Your instrument;
4) Your crook;
5) Your reeds."[1]

Mr Holland plays a Püchner bassoon with a Püchner no. 2 crook, silverplated, and chosen personally out of 50 such crooks at the Nauheim factory "to harmonize with the instrument", as he put it. Thus, the bassoonist needs not only to "match his equipment" (as in the case of the trombonist); he (or she) needs to match all the components of his musical equipment with his physical person.

This "matching" will obviously include a decision on whether to use the neck strap (which itself can be modified by using a bass guitar neck-strap, distributing weight more evenly), seat strap, or William Waterhouse's adjustable peg rest, bass clarinet style (which, of course, must be accompanied by a crook of modified angle), or even some combination of any (or all) of the above.

The hand rest supplied with every German-system bassoon may or may not be of the right angle to suit the player's hand. Players occasionally use it turned through 180°, or even discard it altogether, building up the butt at that point with a layer or two of cork.[2] Players with large hands may make up a larger rest, or modify the existing one to stand further out from the instrument. At any rate, the player's comfort is paramount, and ancillaries may need to be "tailor-made" in some instances.

The **reed** is probably the greatest variable in bassoon playing at any level, and most leading players manufacture their own.[3] Many, however, prefer to have reeds made to their own specifications, and a proliferation of professional reed-makers exists for the bassoonist's (and oboeist's) convenience, both in Europe and the U.S.A. In South Africa good reeds are available from Hombach, Volkman and Volker Braach in Germany, and Peter Musson in Australia. The writer has his reeds made in the style of Volkmann by Mr Werner Eichler of Pretoria, who also produces a **very** good imitation of the Hombach reed, procuring most of his cane from that gentleman. The Brilhart fibrecane reed has been used with some measure of success with beginner pupils, being impervious to humidity or altitude. Most professional players in South Africa find they need two sets of reeds: one for the coastal areas, and a considerably softer set for the Highveld. A good quality reed that is medium-soft at the coast can become unplayably hard in the thinner air(less resistance) and drier atmosphere (particularly in the winter months) of Johannesburg or Bloemfontein.

/74

The effects of the reed and crook on the bassoon's playing characteristics are better understood (and more openly discussed) than was the case a generation ago. Alan Fox,in an article entitled "Bocals", insists that "By far the most singularly important part of the instrument, the bocal, dominates the **response, resistance** and **tone** of the bassoon. It affects the overall **pitch** of the instrument as well as the **relative intonation**....Even a mediocre bassoon may have a reasonably good sound and scale if it is fitted with a good professional bocal."[4] William Spencer points out that a good crook is manufactured to tolerances of within ten-thousandths of an inch, "Thus, a small dent or particle may **completely change the playing characteristics** of the entire horn."(emphasis added).[5] A case in point is the Puchner purchased some years ago by Mr Henry Scott of the erstwhile Cape Town Municipal Orchestra, which refused to perform acceptably unless played with a Heckel crook.On closer investigation, it was found that a considerable amount of excess solder had been left on the inside of the Puchner crook, along the line of the seam. Once this had been removed, the instrument and crook performed as was expected of them.

An obsession with ancillary equipment is to be discouraged, though. As Archie Camden puts it, find a crook "that suits your particular instrument -- and you -- stick to it and get on with your practising...There is far too much hankering after unobtainable perfection in regard to instruments and equipment..." [6]

Or, as an American player put it, "Spend less time making reeds and more time practising!"

Certain occasions do however demand "gimmick" reeds as well as bocals, and Camden (inter alia) advises a "special soft reed" should be used for the infamous *pppppp* ending of the first movement of Tchaikovsky's Sixth Symphony, one of the only occasions where a change of reed during a performance is considered defensible. William Waterhouse, in a review of the 1984 Munich International Bassoon Competition, commented that "Some players craftily changed reed and/or bocal for the final top note" of the Tansman **Sonatine.**[7]

Finally, the addition or subtraction of keys -- including having additional holes bored in the instrument -- must be considered under the heading of ancillaries. The famous Gwydion Brooke, formerly of the Philharmonia Orchestra, has, it is understood, undertaken a good deal of experimentation in this direction, and his Adler bassoon is reputedly much-modified. [8] The high D key for the left hand thumb is regarded as standard equipment on virtually all instruments except the most inexpensive student models, and the high E key -- felt by many to be of questionable usefulness -- is readily available. The writer has played a Heckel with a semi-plateau E (1st finger, left hand) key, similar to the 1st finger, left hand key on the plateau/Conservatoire system oboe, that greatly facilitates the half-holing required for G and Ab below middle C.

/76...Summary & Prognostications

SUMMARY & PROGNOSTICATIONS

AS WE HAVE NOTED, the evolution of the bassoon since the 1870's has been characterised by caution rather than radicalism. Perhaps that is just as well, as a steady evolutionary process is still taking place -- in the hands of the Americans as well as the Germans -- which is now beginning to benefit from the advances of the Space Age. "Spin-offs" from this new technology of the seventies and eighties makes a wealth of new, light-weight and wear-resistant materials available to the builder of bassoons -- at a price. The modern practice of lining the small parts of the bore has added immeasurably to the longevity of the instrument. Tentative experiments carried out over the last eighty years with rubber and oil-based plastic compounds and, latterly, epoxy resins, have brought about an entire sub-culture of their own, epitomised in the Fox and Linton/Armstrong bassoons. In Europe woodwind instruments have been manufactured out of transparent perspex. This use of synthetic materials **must** increase in the future, as more and more young musicians (it is hoped!) take up the bassoon as a means of personal self-expression, and as world supplies of quality maple and other suitable woods become more and more depleted.

It is unlikely that this depletion will occur before the turn of the century, however. The bassoon is -- and is likely to remain for some time -- a highly specialised and somewhat "elitist" wind instrument, calling for an above-average degree of dedication and a very fine ear from its would-be player.

In sharp contrast to the student world of brass, where an over-supply of excellent young players now exists, there remains a decided under-supply of bassoonists in most corners of the musical globe. There are a number of reasons for this. Firstly, as has just been mentioned, the instrument is a demanding one, requiring above-average intelligence, perseverance and aural perception of a student for him or her to reach the stage where they can adequately contribute to an ensemble or perform accompanied solos. Secondly, a very small percentage, per capita, of music educators engaged in school music are primarily bassoonists, and will usually channel new recruits into whatever is most needed in their wind ensemble or orchestra, or onto their own "speciality". Private tuition is expensive (not being subsidised as is the case with the various Provincial Instrumental schemes in South Africa), and is usually given by an orchestral player whose teaching time is limited. And if the person teaching bassoon is not a specialist in that instrument himself, reed and mechanical problems can become the order of the day, rapidly disillusioning young players. As far as embouchure is concerned, that is a far more serious matter in the long term, and the writer is concerned that an entire generation of South African bassoonists is growing up with a pinched, oboe-type embouchure, having been taught by oboeists. To compound the error, one or two of them are now teaching, passing on their oboe embouchure to their students!

There is no instant solution to this problem. One can only hope that instrumental educators will become more aware of the bassoon and its requirements, earmarking suitably promising students for the instrument and passing them on to a specialist as soon as this becomes feasable. This is essential if the country is ever to become self-sufficient in orchestral players or the bassoonists required for the many defence force bands and regimental units. "In the land of the Blind, the One-Eyed Man in King" goes the old adage. We need to break the vicious circle in woodwind education and produce more true specialists.

The design of the bassoon, as we know, still incorporates a number of anachronisms, although the Cuciureanu mechanism is, it is sincerely hoped, "here to stay", and movements in the direction of a neo-Boehm system á lá Klimko and others is discerned from time to time. The anachronisms are being refined, area by area, in the knowledge that the bassoon cannot afford to lose them at the cost of its tonal character. Although a certain "internationalism" in approach is noted on the part of conductors, who tend to require a Heckel-type sound even from players of Buffets, this by no means extends to manufacturers, who adhere fiercely to their own concept. While meeting players' demands (to a greater or lesser degree) and, on the surface, appearing to be Wilhelm Heckel clones, most other makers' instruments remain highly individual in character; anything else would be unthinkable!

The appearance of a new maker in the person of Jeremy Soulsby of 37 Hampton Park Road, Hereford, England, is encouraging, to say the least. There is a two-year-plus waiting list for Mr Soulsby's instruments. Ms Kim Walker, a former student of Roger Birnstingl and Sol Schoenbach, plays a Soulsby in her position with the Turin Radio Symphony Orchestra (1983).

Further than this, the crystal ball remains cloudy. Any significant change to the bassoon as we know it is too far in the future to register clearly here. What is clear is that the instrument will retain its individuality -- regardless of advances in mechanism -- because that is what the players **want**. And, one can reasonably hope, conductors too. While the trombone "is a sleeping giant"[9], the bassoon remains "The Gentleman of the Orchestra".[10]

/80...Footnotes

1: Letter to the writer, October 9th 1981

2: Mr Charles Howell has modified his Puchner in this way, in combination with the use of a seat strap

3: The entire subject of reed-making for the student or professional is lucidly dealt with in Part Two of William Spencer's **The Art of Bassoon Playing** (Summy-Birchard)

4: Alan Fox: Bocals (South Whitney, Indiana, USA)

5: The Art of Bassoon Playing, p. 15

6: Archie Camden: Bassoon Technique, O U P

7: The Double Reed, Fall 1984

8: Dr Albert Honey related a story to the writer whereby Mr Brooke had an extra hole drilled and key fitted to the tenor joint of his bassoon, virtually while he waited, tried it briefly, expressed dissatisfaction with the results and instructed the repairman to remove the key and plug up the new hole immediately!

9: Stuart Dempster: The Modern Trombone (California Press), p.79

10: The bassoon was thus described by the music critic of **The Times** on the occasion of a performance of the Mozart Bassoon Concerto (KV 191) on August 15th 1925.

DOUBLING: POSSIBILITIES & IMPOSSIBILITIES

We are concerned here with the possibilities of doubling between the trombone and other winds, and the bassoon and other winds. Although the possibility of a trombonist or a bassoonist playing a keyboard and/or a string instrument is a very obvious one, it has no relevance to this thesis and will not be discussed further. Except to add, parenthetically, that it is to the trombonist's or bassoonist's musical advantage to have **some** fluency on an instrument capable of accompanying a fellow trombonist or bassoonist, be that instrument the organ, piano, harpsichord, guitar or marimba.

As to the possibility of doubling between the trombone and bassoon, this is a controversial one. The writer has done so -- to the extent of obtaining an LRSM Performer's **and** Teacher's Diploma on each -- but admits that to achieve any great measure of success on the **one** instrument has meant virtually abandoning the other for a considerable period of time. It is **not** an exercise to be recommended to students of either instrument. A seasoned player can maintain an approximately Grade VI level on the "other" instrument with relatively little effort, but climbing above this requires an inordinate amount of practising time. It also gives rise to the occasional "backlash" by the embouchure muscles, and one is reminded of the lines from **The Eddystone Lighthouse:** "What man built up by day, the sea broke down by night"! If one is to indulge one's-self in this kind of musical schizophrenia, the "other" instrument should enjoy the player's intense and undivided attention for at least a year at a time, so that some real standard of competence can be attained.

Having said that, the subject of combining the trombone with the bassoon can be considered to have been set aside until further notice. It will be prudent now to consider the more realistic (and factual) "doubling" options open to accomplished players of the trombone and of the bassoon.

a) Trombone doubling with other Low Brass:

This is so common that it is virtually expected of the trombonist, although certain accepted combinations are in evidence. In a symphony orchestra, the first trombonist is usually expected to double on bass trumpet (not a problem, as it can be conveniently regarded as a narrow-bore valve-trombone by the player), alto trombone (which **can** be a problem -- being pitched a perfect fourth higher -- unless equipment is **very** carefully chosen and matched), and sometimes euphonium as well (this is easier for some players than the bass trumpet).

The second trombone is expected to be able to double on euphonium, and occasionally on bass trombone -- which means having alternative (and matching) equipment. The bass trombone is usually expected to be able to "help out" on second tenor if needed; for this he may use a symphony tenor mouthpiece in his bass trombone, or have a separate instrument altogether. More important, he is sometimes expected to double on tuba which, in spite of the difference in pitch between the two instruments (a minor seventh or an octave), this is the true bass trombonist's "favourite" double. (The symphonic tuba player is often expected to perform Moussorgsky's "Bydlo" on the euphonium, but this is generally safer in the hands of one of the trombone players).

/83

In the free-lance world of the recording studio and stage band the situation is somewhat different. In their **Advice to Would-Be Professional Trombonists**[1] Rex Peer and Roger Bissell strongly advise broadening one's musical talents, abilities and knowledge "in order to give yourself as good a shot at economic survival as possible....especially try to double on bass/tenor trombone, bass trombone/tuba, baritone(euphonium)/trombone. Also, keyboard ability or competence on a rhythm instrument would help, (as would) arranging/copying".

They go on to point out that the bass trombone/tenor trombone is probably the most important, and certainly the most common, double. The writer concurs that the change between bass and **symphony**(large-bore) tenor is easy, but would mention that the change between a full-bore, double-valve bass to a small-bore "jazz" tenor is by no means effortless. Attempted the other way round, it is well nigh impossible without a substantial training period.

The "switch in equipment", as Messrs. Peer & Bissell put it, is the greatest problem in doubling between trombones of different sizes and playing characteristics. The writer has come to the conclusion that finding **different** mouthpieces (that match each instruments bore) with the same or a similar **rim contour** is a major part of the solution. Bissell writes "I've considered screw-rim mouthpieces [2] and so on, but what I ended up doing was to choose two rather **different** mouthpieces for the two trombones, which give me roughly the same **overall** feeling."

Los Angeles free-lance trombonist Alan Kaplan considers it to be in every trombonist's interests to double. He advocates that "A tenor trombonist should work on bass trombone and euphonium, and bass trombonists should work on tenor trombone and tuba. Time should be spent on the doubled (sic) instrument every day." Kaplan suggests warming-up on one's principal instrument "to save your embouchure" and to incorporate one facet of one's playing on the doubled instrument.[3] Sound advice!

Luckily for the trombonist there are certain "matching pairs" of tenor and bass mouthpieces -- matching by dint of their identical rim curvature or contour, that is -- that makes the situation less hazardous than might be imagined. Two examples are the Holton 181 (bass) and Holton's Van Haney Large Bore Tenor, which even appear identical at first glance but have, of course, very different interior dimensions; the Schilke 58 (bass) is a perfect match for the 52E2 symphony tenor. Likewise, the Bach 5G symphony tenor mouthpiece matches the smaller no. 9 rim almost perfectly. The player must simply take the trouble to find out what matching equipment is available, and to find out through largely empirical methods what works for him (or her).

/85...b)Low Brass/High Brass

b) Trombone doubling High Brass

This is not a commonly found doubling, nor is it an easy or particularly feasible one. Whereas, in the case of the trombonist doubling on euphonium or bass trumpet, the player can use the same mouthpiece as he does on his principal instrument (with perhaps a modification to the shank), no such possibility exists for the doubler on high brass instruments. The diameter of a trombone or euphonium mouthpiece will be between 25,4mm & 26,4mm; the diameter of a trumpet, cornet or flügelhorn mouthpiece between 16mm and 17,3mm, and that of a French horn between 17mm and 18,5mm, with a very different rim.

There are a few studio musicians who double between trumpet and tenor trombone (and/or valve trombone), but trumpet is their principal instrument in all cases, and their trombone sound is insubstantial (as is their slide technique). It is not a doubling to be recommended. One that does stand a fairly good chance of working without detriment to either instrument's embouchure is between trombone and French horn; the late Thomas Beversdorf of the U.S.A. was such a player. And, providing the true deep cup mouthpiece is used (the Denis Wick 4FL or 2FL being excellent examples), the trombonist will have more success tackling the large-bore flügelhorn than either the trumpet or the cornet. A real challenge for the trombonist who wishes to remain true to his or her genre is the slide trumpet/ descant trombone.[4] This pure slide instrument has a different "feel" to, and less resistance than a trumpet of similar bore and, if played with the correct mouthpiece blends homogeneously with a trombone choir.

It is worth mentioning that Mr Jeffrey Reynolds, bass trombonist in the Los Angeles Philharmonic Orchestra, directs a Moravian Trombone Choir in his spare time, consisting of Descant, Alto, Tenor, Bass and Contrabass trombones.

The criticism most commonly leveled against the slide trumpet/descant trombone is that A) the positions are so close together(on account of the half-size slide) that it is extremely difficult to play in tune; B) it does not sound like a trombone. Well, granted, it does not sound like a tenor trombone -- nor should it, as the instruments are a full octave apart in pitch -- but, then, neither does an alto trombone sound like a tenor trombone. At least, it's not supposed to. The Descant does blend with other trombones better than does a trumpet, cornet or flügelhorn. As to objection A), this could only have been formulated by players unfamiliar with normal trombone slide technique, for there is absolutely no problem in "putting the slide in the right place", even at speed.

It remains only to mention, under the sub-heading High Brass, the really high brass in the form of the high D,Eb, F or high Bb("piccolo") trumpets. These specialist instruments are beyond the reach of many trumpeters, and trombonists should leave them strictly alone. They are anathama to the low brass embouchure.

/87...c)Trombone/woodwind

c) Trombone doubling with Woodwind.

Unlikely though this may appear at first glance, it is the writer's contention that a Low Brass/Low Woodwind doubling stands a greater chance of success than does a Low Brass/High Brass combination. The bass trombone and tuba embouchures, certainly, are less disturbed by doubling on a really low woodwind -- the contrabassoon, the Eb contrabass or Bb bass clarinet, and Eb baritone saxophone -- than they are by French horn or trumpet. There may be two reasons for this. Firstly, the large single-reed mouthpieces result in an embouchure shape that is compatible with that of the trombone or tuba (the contrabassoon is obviously a special case); secondly, the player is operating in a tessitura with with he is familiar.

Frankly, the low woodwinds present a specialist career all on their own, and the writer is not recommending such a doubling with trombone. The point is made in the opening sentence.

As far as doubling between trombone and high woodwinds is concerned, there is a case for the flute, it being a reedless instrument. The clarinet and higher saxophones require an embouchure that is generally too tight to be compatible with trombone playing, and the oboe embouchure is so specialised as to be at odds with that of every other wind instrument, and diametrically opposed to that of the low brass player.

/88...German bassoon/French bassoon/Contrabassoon

d) German-system bassoon doubling French-system bassoon and/or Contrabassoon.

While the majority of German-system bassoon players may go through their entire life without even seeing a French-type instrument "in the flesh", there is a steadily growing school of thought among players in the United States and Canada that mastery of the French bassoon is actually beneficial to their German-system technique. It naturally also provides the player with an additional mode of expression not too far removed from that of their principal instrument. Just as orchestral trombone sections "switch equipment" to instruments of a different timbre when called for in French programme, the situation is envisaged where bassoonists could do likewise. Dr Ronald Klimko, currently studying the Buffet in Paris with Maurice Allard, writes "...I believe as strongly as ever that the bassoon players of the future could (and perhaps **should**) learn to play both (systems) with equally great artistry. Many players of the French bassoon are dismayed with conductors who have begun to specify which bassoon they want played. Wouldn't it be **marvellous** in the future if the bassoonists were to tell the conductor which instrument they were going to play for each work on the programme?"[5]

In an obvious attempt to bridge the tonal gap between "traditionalists" of both persuasions, the Selmer (Paris) factory now produces a new model French bassoon that has undergone changes to the bore in the direction of the German bassoon. Described by M. Allard as sounding "anonymous and false", these instruments are now played in the Orchestre de Paris.

Klimko observes: "an average player of the French bassoon is most often technically far superior to most 'fagott' players (as the French call them)", and adds that the technique of most German-system players is referred to by French-system players as "situation technique" -- just enough to get by on.[6]

The contrabassoon presents the German- or French-system bassoonist with a challenge of a different kind. There exists, too, a Buffet contrabassoon, which again sounds rather different to the Heckel, Puchner and Schreiber contra, and requires a somewhat different approach, particularly in the realm of reeds.

Here the bassoonist is faced with the same relationship that the clarinet player faces vis-a-vis the bass clarinet: an instrument with almost exactly the same "shape" of embouchure, virtually identical fingering, yet a full octave lower in pitch! The physical part of the fingering presents no problem as the keys of many contras are actually easier to reach than on the bassoon, due to the full mechanisation of the instrument. But pitching can be a problem for the uninitiated, as can breath support; the contra **must** have strong breath support in all registers -- plus a medium-hard to hard reed -- if it is to project in any ensemble.

/90

The contrabassoon has its own specialists, particularly in the U.S.A. where, paradoxically, the contra is still a somewhat neglected instrument outside the symphonic context. The instrument is also gradually acquiring its own solo repertoire: Cregg Henegar, of the Houston Symphony Orchestra, recently premiered a **Concerto for Contrabassoon** by the American composer Donal Erb. Soon to be published is Henegar's **Modern Exercises for the Contrabassoon**; Victor Bruns has written **Two Pieces** for Contrabassoon and piano, and there is a **Concerto** for the instrument by the eminent Gunther Schuller (published Carl Fischer). Irwin Schulhoff has written **Bassnachtigal** for Solo (unaccompanied) Contrabassoon, and Migot's **Prelude** for the instrument is published by Leduc. Gerald O'Conner and Cornelia Biggers are two more American players active on the contrabassoon.

However, the contrabasoon is not a "double" for every bassoonist, and the sheer size of the instrument may be a daunting factor to those of a more modest physical build. Equally daunting is the price of such a instrument, and in most instances funds need to be forthcoming from a teaching or other institution for its purchase. They do exist, but it needs to be an affluent woodwind player indeed who can aspire to his own private contrabassoon!

/91...Bassoon & other Woodwind

e) The bassoon and other Woodwind instruments.

"Many problems with the bassoon embouchure at the advanced level are really breath control problems. It is well to remind the student in this respect that the bassoon is a **wind** instrument, not a **lip** instrument....If the reed is to do its best work, the lips must **allow** it to vibrate -- not **make** it vibrate."[7] This writes William Spencer; a similar piece of advice is proferred by former principal bassoonist of the Camerata Academica Orchestra in Salzburg, Austria, Robert J. Moore: "One of the most common problems ....is the embouchure. So many times the bassoonist has been transferred from the clarinet or the saxophone, and he continues to stretch the lower lip over the teeth and bite on the reed, usually with the corners of the mouth pulled back in a smile...just the opposite of the 'cushion' type of embouchure preferred by most American bassoonists. It is important to get the embouchure away from the teeth so that the reed is supported solely by the lip muscles."[8] Larry Teal, in his chapter on doubling (with saxophone), acknowledges that "The bassoon embouchure is quite different from the other woodwinds, with the lower jaw pulled back, and a great amount of lip used over the lower teeth. The lower lip is altered from one register to the other while the upper lip remains stationary, and very little pressure is used on the reed."[9]

The point of these quotations is to emphasise the **awareness** necessary on the part of the doubler and that, as contrabassoonist Gerald O'Conner puts it, "If you expect to play well on more than one instrument (even related), you should figure on increasing your practice time proportionately."[10]

While it is clear that some bassoonists find it desirable to double on other woodwind instruments, the overall opinion is that one has to work that much harder to maintain one's hard-won bassoon tone, and that it is better for one whose principal instrument is the bassoon to be a doubler than "the other way around".[11]

One such player is Los Angeles studio bassoonist Ray Pizzi, who, in addition to having made a name for himself as an improvising bonafide jazz bassoonist, has four record albums to his credit, featuring work on saxophone and flute as well as on the bassoon. The flute would appear to be a compatible "doubler" with the bassoon, being reedless, and sharing the diaphragm vibrato, while the saxophone -- be it soprano, alto, tenor or baritone, is a necessary prerequisite to entering the performance arena of the recording studio. The baritone saxophone is likely to be the doubling instrument least detrimental to the bassoonist's embouchure, particularly if said baritone is equipped with one of the more compact metal alloy mouthpieces, such as those manufactured by Otto Link or Berg Larsen. Very likely cognizant of the "fringe benefits" involved,Dr Klimko actually encourages some of his students to "take other instruments and voice. Particularly sax.(and some jazz work) usually helps their bassoon playing."[12] Studio bassoonists such as Ray Tricarico, Wally Kane and Fred Alston Jr. are all primarily bassoonists who have added limited doubling to their repertoire, be it on flute, bass clarinet, or one or two of the saxophones only. A more limited or përhaps specialized doubling is certainly justified, considering the exigencies of bassoon technique.

It must be added that in the case of the clarinettist, saxophonist or even flautist, not merely doubling but "tripling", "quadrupling" or "quintupling" is required of the freelance studio musician. In the course of a three-hour recording session he might be required to perform on flute/piccolo/alto flute, and/or clarinet/bass clarinet, and/or any (or all) of the saxophones from soprano to baritone. There are, admittedly, those who are known to specialize in the less-frequently called-for woodwinds such as the proper bass flute in C (one octave lower than the concert flute), bass saxophone or contrabass clarinet. And, of course, the oboe or the bassoon! They are accomodated accordingly within the woodwind section, but the whole situation is very much subject to whims of the arranger who, in the major U.S. centres at least, is accustomed to having this broad palette of woodwind colours at his disposal.

Larry Teal feels, from the saxophonist's viewpoint in particular, that "a realistic view of the musical scene will reveal that the advantages (of doubling) outweigh the disadvantages."[13] Mr Pizzi's efforts appear to have been rewarded, at any rate: he was elected by the Grammy Awards Committee as the "Most Valuable Player" for four consecutive years.

/94...A unique

A unique double between the bassoon and the Renaissance **cornetto**, one which was well known in the recording studios of Deutsche Grammofon's **Archiv** studios, was that perfected by Herr Otto Steinkopf. This gentleman, erstwhile bassoonist in the Concerts Colonne Orchestra, virtually single-handedly brought about the renaissance of the cornetto -- which could perhaps best be described as a **curved** alto recorder in G (rather than F) that is played with a cup-shaped mouthpiece (similar to a small modern cornet mouthpiece, but with a much narrower rim).

The cornetto embouchure is extremely taxing. The instrument itself has no resistance to speak of, and the player needs to purse the lips together far more strongly than in the case of the trumpet or horn. In addition, many notes need to be "humoured" into tune; possibly this is the "linking factor" in technique between the bassoon and the cornetto.

This observation provides the opportunity to lead to another concerning the bassoon/trombone combination: the only common factor that can be positively identified in the playing of these two instruments is the sub-conscious "correction process" inherent in both techniques. In the case of the bassoon, even the German-system instrument abounds in notes which are less responsive than, possess a different timbre to, and have inferior intonation to most of the other notes on the instrument; the player learns to compensate for these various deficiencies by automatically modifying embouchure and/or breath control in order to bring the offending notes "into line"./95.....

This soon becomes a reflex action, particularly when the player has an ear that is of above-average sensitivity. Similarly, on the Bb & F trombone, when the F section is engaged it results in a slight increase in resistance to the player's breath stream, as there is now approximately an extra metre of cylindrical (rather than mildly conical) tubing to be traversed. The player very quickly learns to compensate for this via a slight increase in diaphragm pressure and/or air speed, so that no loss of volume or change of timbre is audible. With the additional D section of the double-valve bass trombone being brought into play, the same compensatory reaction occurs. Thus it should be pointed out that the low (two leger lines below the stave) C and B-natural do not present difficulties to the student because they are low, but because of the abundance of additional cylindrical (i.e. resistance-producing) tubing that is required in order to obtain these notes. The lower (pedal) Bb is considerably easier to produce, as it is the fundamental of the "open" Bb instrument.

If doubling is to be attempted, then, common sense dictates that expert direction be sought on the "other" instrument. Teal reminds us that "The embouchure is not transferable (from one instrument to the other), and the performer must constantly be aware of the instrument he is playing. Often we hear the remark 'when I practice the (X), my (Y) embouchure suffers.' If the embouchure is allowed to freeze in one position this condition is bound to appear.

"The doubler must endeavour to establish the **correct embouchure for both instruments**, and be able to make the shift instantaneously" [14] (emphasis added).

Although non-winds are beyond the purview of this thesis, the following observations on **accompanying media** for the trombone and bassoon are included. It must be stated that relatively few bassoonists or trombonists seem attracted to the **sound** of the pianoforte; they very often merely **accept** it as the medium for which their accompaniment was intended. Given the choice, however, most would agree that the organ -- particularly an instrument capable of a Baroque organ sound, replete with strong 2' flutes, etc.-- is a vastly more effective accompanying medium, particularly where transcriptions are concerned. And, in the case of the bassoon, the harpsichord is a delightful accompanying medium; so, too, is the classical guitar and even the lute. Naturally, only the piano will do for twentieth-century works written for that accompanying instrument, but there is no harm in considering alternatives. What is to prevent a trombone solo being accompanied by a good player on the concert marimba, for instance, when up to four mallets are used? Nothing at all,not even convention. And the accompaniment of Ravel's **Piece en forme de Habanera** can so easily be modified for classical guitar, affording a truly felicitous combination with the bassoon, be it German or French.

/97...Comparison chart

To conclude this section, here follows Larry Teal's comparison chart of performance techniques for the woodwind doubler. It is extremely generalized, and the writer does not concur with the concept of "jaw motion" being an integral part of the tongueing process of the bassoon. It is, however, relevant to this discussion.

	Saxophone	Flute	Clarinet	Oboe	Bassoon
Embouchure	Cushioned but firm	Flexible and controlled	Fairly firm	Firm	Flexible and controlled
Resistance	Variable in different registers	Slight	Most of the single reeds	Considerable	Considerable but less than oboe
Vibrato	Jaw	Diaphragm, throat or combination	None; jaw in dance work	Diaphragm or jaw	Diaphragm
Tonguing	Tip of reed with tip or upper part of tongue	Back of upper teeth with tip of tongue	Tip to tip or slightly away from tip of reed	Tip to tip	Tip to tip with jaw motion
Technical Problems	Extreme upper and lower registers	Upper register	Throat tones and upper register	Upper register. Response in lower register.	Many in all registers
Reeds	Selection and adjusting	None	Selection and adjusting	Making desirable. Trimming necessary.	Making desirable. Trimming necessary.

COMPARISON OF PERFORMANCE TECHNIQUES FOR THE DOUBLER

/98...Footnotes

1: Peer, Rex and Bissell, Roger: Advice to Would-Be Professional Trombonists; Article in the Journal of the INTERNATIONAL TROMBONE ASSOCIATION, 1978

2: Ibid.

3: Alan Kaplan: interview by the I T A, 1981

4: Slide Trumpets/Descant Trombones are currently manufactured by the DEG (Donald E. Getzen) Company and the Giardinelli Band Instrument Company, USA. Mr Larry Minick of Los Angeles will build the instrument to special order, as will Gebrüder Thein of Bremen, W. Germany. The C.G.Conn Company of Elkhart, Indiana, USA, manufactured a slide cornet in pre-war years, now very much a collector's item

5: Ron Klimko: A Letter From Paris, The Double Reed, Spring 1984

6: Ibid.

7: Spencer, William: The Art of Bassoon Playing (Summy-Birchard), p. 48

8: Moore, Robert J.: Some Remedies for the Bassoonist Who Plays SHARP, Woodwind & Band, May 1977

9: Teal, Larry: The Art of Saxophone Playing (Summy-Birchard), p. 97

10: A response quoted in Dr Klimko's Questionnaire

11: Ibid.

12: Letter to the writer, March 28th 1982

13: Teal, Larry: The Art of Saxophone Playing, p. 95

14: Ibid., p. 96

15: Ibid., p. 97

/99...Conclusions

CONCLUSIONS

DOUBLING between **certain** wind instruments is feasable, and up to a fairly high professional level. By the same token, doubling is not a musical activity that can be expected to appeal to **all** instrumentalists, particularly those engaged purely in symphonic activities, where there may be neither time nor motivation to put aside one's principal instrument even for a limited amount of time.

Even to those who are strongly motivated to double, a strong inhibitory factor -- recently identified by Edward de Bono as what he terms **The Edge Effect** -- is often present. This involves the initial momentum necessary in order to make doubling (or any other new activity) a reality, and the "fear of the unknown" that often accompanies this new activity.

Dr de Bono explains that "any path of change that involves an initial difficult or unattractive edge will probably not be followed. This places a terrible restriction on evolution because so many forms of change involve at least **some temporary disadvantage** for an established interest" (emphasis added).[1] The following concrete analogy is provided: "A plane taxies along the runway picking up enough speed to take off. Unitl take-off actually occurs the plane is a danger to itself and to its surroundings."[2] Is this not precisely the problem holding back the development of our Boehm-system bassoon?

/100

And the doubler, still in the stages of developing a technique on his "new" instrument, must certainly be "a danger to himself and his surroundings" until the necessary musical momentum has been generated!

The Edge Effect extends to student practising, too. Routine-shy youngsters, while basically fond of their chosen instrument, and well-motivated musically, have trouble making the initial move of opening the instrument case and assembling it. Once this "edge" has been removed, they practise away merrily, oblivious of the clock! (An obvious remedy here is to have the instrument already assembled, on an instrument stand).

To qualify the opening statement further, the feasable doublings must be identified once again. In the case of brass/brass, the major factor is **the matching of mouthpiece rims**, regardless of whether the instruments are of high, medium or low pitch; certain combinations that are more favourable than others have been identified in the previous chapter. In the case of woodwind/woodwind, the necessity for the "second" (or "third") instrument to require an embouchure that is in some way **compatible** with that of the principal instrument, has been stressed. In the case of brass/woodwind, the prognosis is generally doubtful, except in isolated special cases which have been mentioned; low brass/low woodwind in particular having been cited.

Larry Teal sums up some of the primary requisites for the doubler on woodwind:-

1. Possession or development of a sensitive musical ear. Relative pitch perception is very important, since many of the instruments are transposing and it is necessary to orient to the sound of several pitches from the same written note. These people gifted with absolute pitch may find this a detriment, as they hear only in concert pitch. This poses special problems.

2. Flexibility of the embouchure and supporting muscles, plus development and control of all the muscles affecting the various lip positions, as each embouchure uses a different combination.

3. Some mechanical ability to acquire skill in keeping the various instruments adjusted. In the case of oboe and bassoon, reed-making and trimming are also a necessity.

4. Muscular co-ordination and flexibility of the fingers and hands.

5. Realisation that practice time must be expanded to accomodate the added burden, and that each instrument must be practiced regularly.

6. The use of the best possible instrument is paramount for the doubler, as he has enough problems without the added handicap of an inferior instrument....It is better to wait until the necessary finances are available than to purchase a cheap instrument which will produce only frustration and disappointment.[3]

The writer concurs heartily, adding that the perfect pitch syndrome referred to in 1). is only a problem when the individual is musically **inflexible**. In regard to 2), the doubler **must** be selective in deciding how many different embouchure applications he can reasonably accomodate! In connection with 6): the quality of the doubling instrument does indeed need to be as good as that of the player's **principal** instrument. This can obviously lead to a considerable capital outlay, on brass or woodwind.

To complement Teal's admonitions, the following viewpoints are proffered by the writer: If one is to double at all, the player must already possess a solid technique on his or her primary wind instrument, and be motivated by the following factors:-

A) A compelling wish to perform (as well as to express one'sself musically) on the alternative instrument(s);
B) A firm and unambiguous concept of the tone quality one wishes to produce on the alternative instrument(s) (as the late Archie Camden put it, "Ultimately, a player will have the tone that his ear demands")[4];
C) The circumspection to avoid the alternative instrument(s) technique(s) and embouchure(s) becoming detrimental to that of the principal instrument (bearing in mind the "edge effect");
D) A personal committment to devote the necessary **time** and **attention** to the pursuit of both (all) instruments (which involves more intellectually than mere"practising";

E) Preparedness to seek expert advice and guidance from specialists on the alternative instrument(s).

Just as "Human intentionality is the glue that binds the rules of Linguistics together"[5], it must also be the momentum behind the playing of any musical instrument or combination thereof. For the writer's part, the erstwhile practice of doubling on two unlikely "companions" -- the trombone and the bassoon, who have little in common other than a portion of their repertoire -- came about not as the result of any whim or caprice. A challenge, rather; it was the **only** action to take in the face of an overwhelming love for both instruments, their timbres, and their playing characteristics.

1: *Edward de Bono: Future Positive (Pelican), p. 99*

2: *Ibid., p. 63*

3: *Larry Teal: The Art of Saxophone Playing (Summy-Birchard), pp. 95 & 97*

4: *Archie Camden: Bassoon Technique (O.U.P.), p. 14*

5: *John Searle, Professor of Psychology at the University of California, in an S.A.B.C. "University of the Air" broadcast.*