Histories of Brass Band Instruments

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The History of The Cornet, From Pre-History to the Present

How It All Began

The history of all musical instruments begins with the very young, as has been demonstrated through a variety of recent studies concerning the behavior and development of children.

Unlike adults, children "play." This is where they explore and develop their life skills, including verbal, vocal, communication and language skills. Children have many times the ability of adults to assimilate, manipulate, and *create whole new vocabularies and languages*. Recent studies into the history, taxonomy and origin of language itself, point to children as the original creators and developers of language.

Children instinctively test the limits of their own physical capabilities and explore their immediate surroundings and environment in ways that adults do not. They climb, run, wrestle, throw, picks things up, poke and pry at them, stick them in their mouths, bite them, pull them, drag them around, pluck them, blow through them, hit them . . . it was inevitable that one day, some child wandering away from a group of women gathering food, idly picked up a blade of grass, stretched and held the grass it between its thumbs, blew on it experimentally, and created the first reed-like instrument. Another child found a precious toy laying to one side of a trail. It was the hollow casting of the horn of some animal. The child, being a child, put the small end of the horn to its lips and did something no adult would ever have thought of doing. Another child belonging to our primeval past discovered the curious resonance of striking a hollow piece of wood. Another discovered the pleasing sound of drumming upon a skin that had been stretched over a wooden hoop, a primitive instrument that exists even today amongst the Inuit and the Celts (the bodhrán).

Children grow up and the games of youth are set aside, but not before the things a generation of children have learned are passed along to the next. Adults, who were once children themselves (it is hoped), though slow to change, eventually and inadvertently learn that the toys of youth have deep implications and uses in adult life; for rituals, because to the primitive the things of youth must have seemed like they belonged to some ancient collective memory; for defense, for the hunt, for warfare, for communication over long distances; and lastly, for social rites in the days before secular entertainment.

The First Horns

Hunting Horn

Like the simple wooden flute, the bull's horn has been with us for a very long time. We know from ancient accounts that the horn was used to communicate over long distances, but how far a distance? In the aeons before the sort of background noise pollution we have all become accustomed to, the sound of a horn could be heard for miles. As well, sound carries over water- so well, in fact, that on a calm evening, while on the water, normal conversation may carry up to half a mile. And the reflective properties of hillsides and mountains can sometimes carry the sound of a horn a good ten miles and more!

How was a bull's horn used in hunting? There were two ways. No one is certain which of these characteristics came first but the bull's horn was used by hunters to pass on needed information in the conducting of the hunt. As well, the bull horn was used to summon game. A person adept at such skills can imitate a wide variety of game animals. Also, the bull's horn generates low-frequency sound of a type that carries well.

By the time mankind learned to work and alloy such soft metals as copper, zinc, lead, tin, gold and silver (the Bronze Age), horns were first decorated and adorned by these metals, and eventually were fashioned completely *from* them.

These instruments originally came in the form of a straight trumpet, the oldest surviving examples of which were found in the tomb of the Egyptian king Tutankhamun in 1922, and which date from circa 1352 BCE.

http://www.npr.org/programs/pt/features/2003/jun/trumpet.html

Post Horn

By the time it became possible to bend metal tubing, three general shapes became known: the circular "horn" design, the "trumpet" design, and the "bugle" design.

The horn design featured a funnel-type mouthpiece, circular configuration, conical bore and mellow, pleasing tone. The trumpet design featured a cup mouthpiece, forward-facing configuration, cylindrical bore, and strident, blaring tone. The bugle design featured a deep cup mouthpiece, forward-facing configuration, conical bore, a more mellow and pleasing tone than the trumpet, and easier playing of slurring, tonguing and intervals.

Name Origins

The word "horn" refers to its origins- that of being an animal horn, usually belonging to the castings of a young, growing bull. The word "bugle" is derived from the Latin "buculus," meaning "young bull." The "cor" of "cornet," "cor anglais" and "tenor cor," has its roots in the Latin "cornu," meaning "horn."

Early Mouthpieces

The earliest known mouthpiece was the smooth, round opening at the small end of the horn itself. As these and other primitive horns became better made and more ornate, they were fitted with mouthpieces fashioned from wood, bone, ivory, and later on, copper, tin, pewter, silver, gold, brass and bronze. Ivory and ox-horn mouthpieces dominated for a time, adorning a good many lip-vibrated aerophones, including the church and military serpent.

The Two Basic Bore Types Found in Brasswinds

A conical bore is a bore in which the tubing is tapered from mouthpiece shank to bell. A cylindrical bore is a bore in which the sides of the tubing, excepting in the bell and lead pipe, are parallel to each other.

What Were These Early Horns Used For?

The metal horn was used for hunting and battle, though over time became primarily associated with hunting. The bugle was primarily a military instrument because of its dexterity, its small, easy-to-carry size, and the way the sound carried through the riot and mayhem of battle. The trumpet saw wide use as an instrument of heraldry, marking announcements, the arrival of dignitaries, and punctuating the pomp and bombast of the royal court.

Horns of all types have also been widely used in various religious capacities since the dawn of recorded time, especially by the Semitic and Arabic peoples. The religious connotation of horns in the European tradition was still prevalent in the 19th century, as is evidenced by remarks made by classical composers such as Gluck and Berlioz.

The Keyed Bugle and the Valved Posthorn:

Progenitors of the Modern Cornet

By the late 18th century, though inventions were many and competition was fierce between inventors and the patent offices they dealt with, the lowly bugle had long ago been overtaken by every other instrument. The natural trumpet, which was so long that the partials in the playing range were close together, could play fairly complete scales. The natural horn, by means of skilful manipulation of the hand inside the bell, was also able to play a complete chromatic scale. The bugle, however, was still primarily little better than an army signaling device, music-wise.

Circular Cornet with Crooks

But in 1810, in Dublin, Ireland, the bugle-maker and inventor Joseph Halliday placed keys on the bugle family of instruments, and produced the first keyed bugles, the bass version which came later being called the ophicleide. Halliday named his keyed bugle the "Kent horn" or "Royal Kent" bugle, after his military commander, the Duke of Kent. Suddenly, here was a bugle that could play the entire chromatic scale. It became especially popular following the Battle of Waterloo in 1815, when the British public heard and saw this instrument for the first time during the subsequent celebrating. Because of its small and practical size, military bands adopted this instrument soon after, leading to an entirely new and revolutionary musical ensemble- the all-brass military band.

Five years after the invention of the keyed bugle came another revolutionary invention. Two inventors, Blühmel and Stoezel, added valves to a horn, the design of which was patented in 1818.

A few years later, in Prussia, inventor Wilhelm Wieprecht invented his "Berlin pistons," the piston design similar to the one we know today. Wieprecht went on to design an instrument whose mighty bass sound was much in demand long before its actual invention- the tuba.

The Coming of the Modern Cornet

In France, in 1828, an inventor named Halary (otherwise known as Jean-Hilaire Asté) added valves to the circular Posthorn, calling his invention the "cornet ordinaire." A few years later he invented a bell-forward instrument of more flattened proportions which he called the "cornet-a-pistons," otherwise known as the "cornopean."

Cornopean or Cornet-a-Pistons

There is some evidence that a fully-formed cornet à pistons may have existed as early as 1825, as Périnet mentions on a patent sketch that a third valve was added to his 2-valve cornet à pistons, but no instrument or other documentation survives to verify this information. As well, the 2-valve cornet à pistons had been around a few years, but as playing a chromatic scale was only possible if one hand-stopped the bell, it is apparent that the 2-valve instrument represents a taxonomic missing link.

At first glance the cornopean looks pretty much like the modern cornet. The main difference is that the valves, rather than residing in the middle between lead pipe and bell (as is the case with the modern version), are on the far left. Also, looking down upon the tops of the valves, one can see that the middle valve is offset to

accommodate the lengths of one's middle three fingers. This is because the cornopean was played in splay-fingered fashion, because one had to literally stretch one's fingers over the tubing in order to reach the valves.

French Cornopean with offset middle valve

At this point I would mention that although Adolphe Sax steps into the picture, he neither invented the circular cornet, nor did he invent the "over-the-shoulder" design employed by his Saxhorns. That distinction goes to Allan Dodworth, who patented the "over-the-shoulder" design in 1838.

In the early 1840's Adolphe Sax arrived on the scene with his family of valved bugles, or Saxhorns as they became known. They ranged from an E flat soprano to an E flat bass. This entire family of brasswinds is important to us, primarily because they constitute the makeup of the traditional British brass band, but as this piece deals with the cornets, only the top two voices will be mentioned here.

In his early days, Sax manufactured keyed bugles and cornopeans (and a variety of woodwinds as well). When it came time to create his Saxhorn family of valved bugles, he selected three designs- helical, upright and over-the-shoulder- for the top two voices of his new brasswinds, the E flat soprano and B flat Saxhorns. The latter instrument was sometimes referred to as the alto in British nomenclature. The helical design with its bell upraised at approximately a 45 degree angle, in particular, was very popular during the American Civil War, and in Europe until circa 1900, right alongside the valved Posthorn-style circular cornet. All the other Saxhorns came in upright and over-the-shoulder form.

At Last!

The modern cornet as we know it today, with the valve casing in the middle between the lead pipe and bell tubing, and with Shepherd's crook at the beginning of the bell tubing, was first manufactured by Antoine Courtois in 1855, and was called the *modèle anglais*.

About the Shepherd's Crook ...

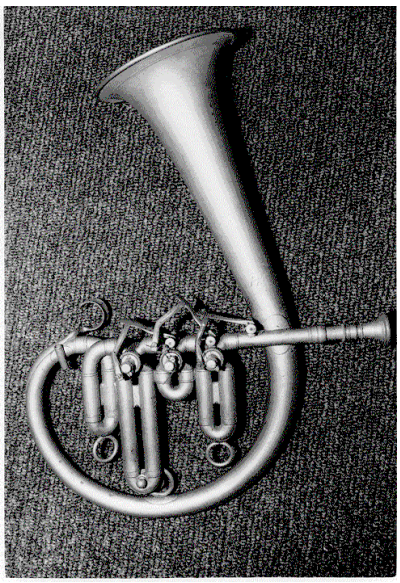
Modele anglais style

It is a baseless myth that the shepherd's crook has anything whatever to do with the tone of the cornet. The tone is not determined by bends in the tubing. It is determined by the type of metal used, the bore size, the thickness of the metal, bell-type, etc. A top-of-the-line pocket trumpet, though wound like a pretzel until a fraction its usual length, nevertheless sounds just like any other trumpet. If bends in the tubing produced a mellow or dark sound, the pocket trumpet would be at least 200% darker and more mellow-sounding an instrument than any cornet, which simply is not the case. The true purpose of the shepherd's crook is to shorten the overall length of the instrument whilst clearing the bell tubing away from the mouthpiece

The E flat Soprano and B flat Alto Saxhorns

Prior to the development of the modern cornet there was the E flat soprano and B flat alto Saxhorn, which were used as the highest sounding voices in UK and US brass band music until their demise shortly after the US Civil War.

Helical Eb Soprano Saxhorn



Most modern versions I've tried have a modern cornet bore profile, and resemble the original instruments only in shape, but the originals and faithful replicas I've tried have the trademark Saxhorn idiosyncrasy, the out of tune fifth partial, which might help to explain the demise of these particular instruments, in light of the near-flawless intonation of the modern trumpet and cornet.

In the US, these instruments were known primarily as round, circular or helical cornets. In fact, I've found remarkably few references in the US to Saxhorns as such, except for the over-the-shoulder design and some of the old-fashioned upright lower brasses like the tenor horn and baritone, prior to their having been redesigned to shorten their height. The subsequent incarnation of these instruments are rarely referred to as Saxhorns.

The Relationship Between the Modern Cornet and Trumpet

Though the trumpet is an instrument in its own right with its own history, it is impossible, when writing a piece on the cornet, not to mention the trumpet, because of the borrowing of ideas during the development of keyed and valved brasswinds.

More than ten years before Joseph Halliday made his first keyed bugle, the instrument-builder Anton Weidinger built a six-key trumpet upon which he performed Haydn's famous trumpet concerto in Eb, though neither this instrument nor Haydn's composition were a first. Weidinger's keyed trumpet was based upon earlier instruments. Part of the proof lies in the fact that there are works for keyed chromatic trumpet that predate the Haydn concerto in Eb. Regardless, Weidinger was a keyed trumpet player well before 1800, the keyed trumpet is known to have existed in some form at least as early as 1750, and the progenitors before the addition of keys, trumpets having holes, date back to the Baroque era, so the underlying principle was certainly nothing new.

Joseph Halliday's success with his keyed bugle was mostly serendipitous. Knowing of the keyed trumpet, he merely cut holes in the sides of a bugle and added keys. In this sense, rather than being an inventor, he was rather the successful marketer of a timely idea. The demand for chromatic brass preceded the invention and supply, and at the time, demand was at an all-time high.

That the rotary-valve trumpet was invented in 1835 by Joseph Riedl, and the piston-valve trumpet by François Périnet in 1839, is noteworthy, if only because these instruments predate the modern cornet whilst demonstrating the pre-existence of the needed technology to build the modern cornet.

Though it is said of the modern Bb trumpet that it is a cylindrical-bore instrument whilst the Bb cornet is a conical-bore instrument, in truth, both the modern Bb trumpet and cornet are conical-bore instruments. In point of fact, they are both cornets: the modern Bb trumpet is not a trumpet.

The proof of this was verified only very recently by Kenton Scott's Horn-u-copia website. Until recently it was known that the Bb trumpet first appeared in the 1880's as a rotary-valve instrument in Europe, but the Perinet-valve variety was something of a mystery until the Horn-u-copia website was able to verify what many of us had long suspected- that the modern Bb Perinet-valve trumpet first appeared on the market circa 1910 *as a cornet*, not as a trumpet. The first instruments came with a cornet mouthpiece and were sold as "long-model cornets".

The *rea*l Bb trumpet, in fact, is and always has been the Eb contra-alto trumpet whose useable range is identical to the Bb cornet. The contra-altos in D, Eb and F have the same useable range as the A, Bb and C cornet.

Separating the Bb cornet and trumpet in terms of category has always been problematic, if not because they are both cornets but because the cornet itself has drifted away from its original design. Certainly in circa 1910 there were cornets that were more cylindrical than the average Bb "trumpet". Many of the instruments dating from this period had an "S" shaped configuration between the lead-pipe and valve-casing that necessarily consisted entirely of cylindrical tubing (because each bend included a slide) which accounted for a large proportion of the instrument's overall length.

In the final analysis it is the ear that must decide, and when both the modern Bb trumpet and cornet are performed side-by-side with the *true* Bb trumpet, the Eb contra-alto, one can clearly hear which is a true trumpet and which is not. For this

reason the contra-alto in Eb and F is regaining popularity in the symphonic repertoire because the Bb variety cannot reproduce the martial qualities of the contra-alto.

The Other Cornet

A family of instrument that gets too little attention these days is that referred to as the cornet, cornett, cornetti, zinck, and a variety of other names. These were lip-vibrated aerophones made of either horn or wood, and which were played either with or without a mouthpiece. In the latter case, the mouthpiece was carved right into the instrument. They deserve mention here because they bear the same name, they were a lip-vibrated aerophone, they had a conical bore, they had a cornet-like sound, and they played an important role in early Western music.

Many find them devilishly hard to play, because the mouthpiece diameter is much smaller than that of the modern cornet/trumpet.

These instruments could also play the chromatic scale, back in the 1400's!

A Final Note:

The Taxonomic Link Between Language, Idea and Design

It has been said that the discipline of taxonomy is of limited use where the design of musical instruments is concerned. The reason given is that taxonomy refers primarily to organic processes that are linked by a genetic component. In other words, things cannot happen spontaneously in nature. Nature cannot be inspired to create a new and novel design. Everything progressive in nature is a series of adaptations contingent on the existing state of the organism in question.

In the inorganic world, it has been argued, the builder is free to act upon whimsy, making leaps of intuition that are not in keeping with the workings of genes.

I strongly disagree.

The constituents of human thought, viz. language, can be analyzed taxonomically (The origin of language: tracing the evolution of the mother tongue, by Merritt Ruhlen, pub. by John Wiley & Sons, Inc., ISBN 0-471-58426-6). Furthermore, the uses to which language are put likewise are possessed of taxonomic properties. For this reason, all human thought moves along lines that are clearly and obviously evolutionary, and therefore taxonomic. And it is telling that our basic tool of reasoning, Logic, acts as an analogue for genetics in biological processes.

The sum total of human knowledge follows lines of classic taxonomic structure, and evolves just as living organisms evolve, though through other means. To argue otherwise is to ignore the fact that Man cannot conceive of anything wholly outside his experience and the *modus operandi* of his own senses, any more than he can freely invent words at a whim. Even nonce words must be shared by mutually perceiving minds if they are to have any use beyond that of mere intellectual exercise.

My reason for raising this matter is to caution the reader to exercise a healthy skepticism. If a book says so-and-so "invented something out of the blue" on such-and-such a date, do not take it on faith that this is so. In point of fact, more often than not such claims are pure baloney. Complex inventions like timepieces, scientific instruments and musical instruments are invariably fusions of disparate knowledges and types of manufacturing expertise, and which are often brought together for purposes entirely different than that of the original, often by a number of people working independently. The kind view is that these people are unaware of each other's efforts. My view is that they knew very well, in view of the fact that they were competing fiercely with one another.

That said, here is what I mean by pure baloney: Galileo did not invent the telescope, though if you watch television shows like Jeopardy, Galileo is invariably the answer to the question, "Who invented the telescope?". The earliest known telescopes were made by Hans Lippershey in 1608. Bell did not invent the telephone. Nicola Tesla, Elisha Grey, and Antonio Meucci (who was perhaps the earliest) all beat him to it. Several of the historic explorers were frauds. The Wright Bros weren't the first to fly. Sax did not invent the saxophone. Halliday appropriated the design of the keyed trumpet in order to make his keyed bugle, and Henry Distin intentionally ripped off the design of Herman Koenig's horn when he built his first Ballad Horn. The list is endless.

What is safe and proper is to remove the words "invented" and "(the date given)" in your mind, and to substitute the knowledge that certain components became available around a certain time and were put together to make a particular instrument, and here is an example from that time, made by so-and-so. For example, keys such as those used on the keyed trumpet and bugle were used on woodwinds a long time before. The ability to fashion a tube or cone of metal and bend it into a circle or trumpet- or bugle-like shape also predates either instrument by a very long time.

In point of fact, "invented" is far too strong a word. The parts were available long before the actual instruments got made. What was missing was a catalyst that would bring those particular attributes together.

That catalyst was the growing complexity and demands of the music of the time, plus the growing size of the symphony orchestra and its attendant expanding audience, and the creation of the brass band which usually played outdoors.

In other words, the demand preceded the so-called "invention." That's not "inventing" in the true sense. It is the unconscious employment of the underlying principals of taxonomy (if not those of socio-economics), for which Mankind seems to think he has the right to take credit.

Silly humans. Taking credit for inventing the inclined plane, usually in places with lots of hills and valleys and mountains.

No wonder we once wanted to believe the Earth was flat . . .

The History of the Flugelhorn

In the Beginning

Hunting Horn, Normandy, ca 1650

The early 18th century Fluegel horn was a large hunting horn of semicircular configuration. It's bearer was referred to as the "Flügelmeister." The rôle of the Flügelmeister was to direct the phases of the hunt, which like its British counterpart was a formalised affair. During the Seven Years War (1756-1763), a war of near worldwide proportions involving Europe, North America and India (which confirmed Prussia's new rank as a leading world power and made England the world's chief colonial power at the expense of France), the Fluegelhorn was adopted as a military instrument.

The name, *Flügel*, means *flank* or *wing*, and probably originally referred to the flanking manoeuvre used to encircle and trap prey in the course of the hunt. This name is not altogether appropriate for the conducting of warfare, because the flanking manoeuvre is but one of many types of signals that would have been given during the course of battle. The signal for full retreat inevitably comes to mind.

A Family and its Related Instruments

Eb soprano Flugelhorn and Bb upright

Most of us today, when we hear the word "Fluegelhorn," think of an instrument that looks like a cornet or trumpet with a very large bell. This notion is fiction for the most part because the instrument in question is most often the Infantry-model Saxhorn. The true flugelhorn is almost exclusively a rotary-valve affair which has a very wide bell with little or no flare.

Where the true fluegelhorn is concerned, in the 18th century it was fashioned of metal and wrapped in trumpet fashion to form the military bugle. Circa 1810 this version of the instrument was given keys, courtesy of the Dublin instrument builder Joseph Halliday. This instrument, named for the Duke of Kent, is today known as the keyed bugle, and the keyed bugle in turn is a keyed flugelhorn. They are one and the same instrument.

It is not currently known who first added valves to the flugelhorn, but various incarnations of this instrument soon followed, and by the mid-1800's had led to the creation of entire families of instruments.

The Fluegel family in its entirety consisted of: an E flat soprano, B flat alto, the B flat tenor (also called the bass) and the E flat bass. Fluegelhorns have also been made in such other various keys as C, F, G and A.

The Various Spellings

The word Fluegelhorn has been variously spelled: Fluegelhorn, Fleugelhorn, Flügelhorn, Fluglehorn, Fluegel horn, Fleugel horn, Flügel horn and Flugle horn. There are other variations, but these seem to be the most common.

In Italy and Spain this instrument is referred to as the fiscorn, fiscorno, flicorn, and flicorno.

Untruths of Indeterminate Origin

This researcher has repeatedly come across "information," much of it offered as fact by otherwise reputable reference books and Internet resources, stating that: Antoine (Adolphe) Sax *invented* the Fluegelhorn; that the Fluegelhorn is *a member of the Saxhorn family;* that *the Fluegelhorn was originally Sax's E flat soprano or B flat alto Saxhorn instrument*, and so on.

Sax could not have invented the Fluegelhorn. It's existence has been noted since the beginning of the 18th century. The Fluegelhorn is not a Saxhorn. The instruments attributed to Sax that appear on his 1840's patent sketches and in his 1850 catalogue are not flugelhorns.

The Reasons for the Confusion

1865 EG Wright E-flat Soprano Flugel

Circa 1846, German bandmasters began referring to the new E flat soprano Saxhorn as a Flügelhorn, while in continental Europe there was an F or E flat soprano instrument referred to as the *petite bugle* in France, and the *pikkolo* in Germany. The Eb soprano and Bb alto Saxhorns, however, are not Fluegel instruments, as they have a saxhorn, not a flugle bore-profile. The mouthpiece, bore profile and bell-size of the Saxhorn family of instruments, while derived from the valved bugle, are a departure from the flugle design.

This confusion stems from interchangeable usage of the words *Fluegelhorn* and *bugle*. In many cases what is being referred to is actually one and the same instrument. The keyed bugle is considered to be the parent of both cornet and valved Fluegelhorn, and this claim is true. The modern cornet and the fluglehorn share a common ancestor in the keyed bugle.

Design and configuration were anything but standardised in those days, along with the nomenclature. Many people continued using these non-standardised names long after standardised design configurations and names were established, the way a person might refer to a trumpet or cornet as someone's *bugle*, or *horn*, or if we were in 19th century Germanic Europe, *Flügelhorn*.

1873 Herold 4-valve with keys

This researcher has come across many instruments bearing names that are clearly inappropriate by today's standards, through regional convention or because of the then non-standardised word-usage. I have seen examples of cornets that are Fluegelhorns, trumpets that are cornets, Fluegelhorns that are cornets, trumpets that are early circular cornet\posthorns (*cornet ordinaire*), and so on.

So for the sake of clarity and continuity, this researcher will refer to *all* instruments having the universally accepted Fluegel profile as *Fluegelhorns* or *instruments having Fluegel characteristics that place them squarely in the Fluegel family of instruments*. The same goes for instruments belonging to the Horn, Cornet and Trumpet families.

Building Materials

Fluegelhorns in the past have been made from a number of unlikely materials, including wood, clay and ceramic. They have also been made entirely of: brass,

bronze, silver and nickel. The modern Fluegelhorn is most often made of brass, and is sometimes electroplated with silver, nickel, gold or copper (rose).

The Modern Instrument That Isn't

E-flat and B-Flat Infantry Saxhorns

The modern instrument everyone calls a fluglehorn is actually not a fluglehorn. It is a saxhorn that was patented by Sax in the 1840's and which first appeared in the 1850 Sax catalogue. It is properly called an Infantry Saxhorn.

If Antoine (Adolphe) Sax ever worked on fluglehorns, there are no surviving instruments to support such an assertion. His instruments people today refer to as “fluglehorns”, the Eb soprano and Bb alto, are actually the two highest sounding members of the saxhorns.

The distinction here is that fluglehorns are a Germanic instrument whilst the saxhorns are a family of Franco-Belgian instrument that are *derived* from the valved bugle.

The 1830's Dodworth brass, the Saxhorns, and almost two centuries of confusion

In the 1830's the American Allen Dodworth created an entire family of marching brasswinds he termed *ebor cornos*, or New York horns. This entire family consisted of valved bugles. Certain of these horns had bells that faced backwards, known as OTS or “over the shoulder” brass (patented in 1838), and were often referred to as “backwards blasters” by their players.

Beginning in 1844, Antoine (Adolphe or Adolph) Sax created a family of instruments that were marketed as Saxhorns, which in design were an adaptation of the valved bugle, and which have down through the years been incorrectly identified to as a family of “valved bugles”, “fluegelhorns” and “tubas”.

Over the years these two families of instruments have been confused with each other, to the point where much of the historical reference material is a muddle consisting of misunderstanding, misinformation, and mis-attribution.

What seems to have happened is this:

The American market originally consisted of Dodworth brass until some time after 1845, when Saxhorns gradually began replacing Dodworth’s *ebor cornos*. Dodworth himself was said not to have minded as he felt the Saxhorns were better instruments.

During the shift from Dodworth brass to Saxhorns, European makers such as Leopold Uhlmann of Vienna (who made valved bugles) first began filling contracts for Dodworth brass, but over time began filling contracts for Saxhorns instead.

1880's Leopold Uhlmann Flugelhorn

In the minds of people in the US this gradual replacement led to a general confusion between these two distinct groups of instruments, to the point where descendants of Dodworth were forced to defend his inventions against what amounted to a simple misunderstanding, wherein it had become the pervading belief that Saxhorns and Dodworth brasswinds were one and the same thing.

Over the years some have claimed (even at the time, in fact) that these two families of instruments came into existence purely by chance. However, it must be remembered that both Dodworth and Sax knew key people of note like Uhlmann of Vienna, and that Sax knowingly modified the valved bugle in order to create his family of Saxhorns. So the claim of "chance" is a dubious one at best.

The Modern Fluglehorn

Fliscorno in C

In my original piece on the fluglehorn and its history, the best information I had at the time indicated that the fluglehorn had been extinct since circa 1900. However, a number of European readers have since set me straight on the matter, pointing to a number of modern makers.

Two companies with web sites readily accessible to those who wish to see modern versions of the fluglehorn are Lidl and Voigt. Lidl makes a number of models of Bb fluglehorn, and Voigt makes a very find bass fluglehorn.

A good many European companies make the genuine article today, but tracking down their instruments is often a beastly chore for English-speaking people because few of these sites are in English, few English-speaking people know what a real fluglehorn is, and the search is made even more difficult by virtue of the fact that few of these modern makers refer to these instruments as fluglehorns. The terms used, depending on the language of the site, are *flicorno, flicorn, flicorni, fiscorn, fiscorno*, and *fiscorni*.

Also, some companies also make a Bb Infantry Saxhorn, sell it as a "fluglehorn", and sell their fluglehorn as a *fiscorno* or *flicorno*.

The History of the Tenor Horn

The Inventor, Antoine (Adolphe) Sax Nov. 6, 1814 - Feb. 4, 1894

Adolphe Sax

Adolphe Sax, son of cabinet-maker Charles Joseph Sax was born November 6, 1814 in the town of Dinant in the Meuse valley in Belgium. Though christened Antoine, he preferred to be called Adolphe. He was the eldest of eleven children, eight of whom died during an epidemic.

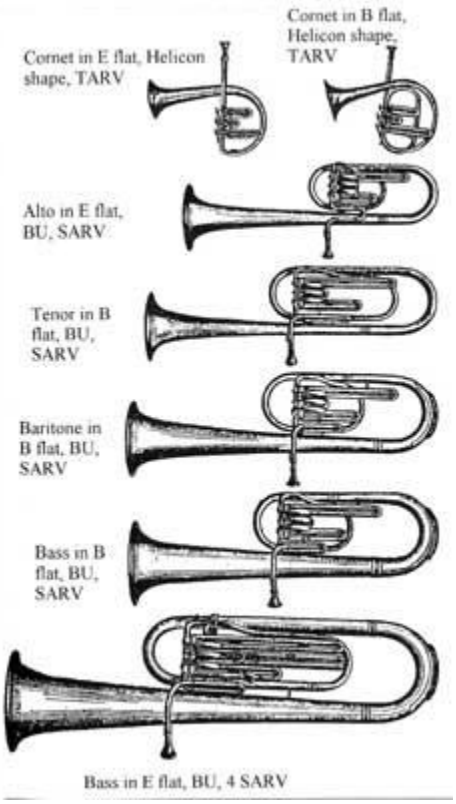
His father, Charles, turned his mind to the manufacture of musical instruments, creating brass instruments, bassoons and clarinets of such high quality that he was appointed Instrument Maker to the Court of the Netherlands by King William I. Needless to say, Adolphe followed in his father's footsteps.

Adolphe's practical musical education consisted of studying voice, flute and clarinet, the latter instrument on which he was reputedly especially adept. Equally important to his career as an instrument-builder was the fact that his father pioneered research into the placement of holes in a tube in order to gain the best possible intonation.

From 1840 to 1844, Adolphe worked on the instruments that were to be called Saxhorns, a term said to have been coined by John Distin and his four sons. The Distins were famous virtuoso musicians who for many years played, toured world-wide and promoted Sax's creations. One of the sons, Henry, eventually became a famous instrument builder in his own right.

Adolphe first exhibited his Saxhorns in Paris in 1844. Included, of course, was the first tenor (alto) horn, but at this stage it was a keyed bugle; only the basses had valves. By 1850 he was selling a number of valved instruments, from a circular soprano cornet to middle brass to basses, that came both in an over-the-shoulder configuration, and in the more familiar bell-up configuration. Some of these instruments, like the tenor, baritone horn and basses, have changed little in their internal design to this very day.

Saxhorns



What Constitutes a Saxhorn?

Generally speaking, Saxhorns are conical-bore instruments, using a cup mouthpiece, that belong to the cornet family, and range from the E flat soprano to the BB flat bass. A conical bore is a bore that is tapered throughout its entire length. The trumpet family of instruments, on the other hand, employs the use of a cylindrical bore. A cylindrical bore is a bore in which the sides of the tubing remain parallel, excepting within the lead-pipe and bell.

Mouthpieces come in a number of designs. The ballad horn, “French” horn and Flugelhorn employ the use of a “funnel-type” mouthpiece. Most other brasswinds use a “cup” mouthpiece. A few common mouthpiece designs are: funnel, cup, “V”, parabolic, shaped or compound, screw-rim for changing rims and bowls, and “cushion” meaning wide-rimmed.

The Purpose of the Two Saxhorn Design

The over-the-shoulder design of brasswinds with their bells pointing backwards seems an odd sort of convention today, but this design had a simple, practical purpose: as the band marched at the front of the army, in order for the soldiers to hear the band clearly so that they could march in step, Sax designed instruments that would direct the sound backwards toward them. Of enormous benefit to the musician was the fact that the balance of the instrument was perfectly centered over the middle of the shoulder.

Another method of balancing the horn, of course, was to build it in the vertical position. In the auditorium and concert hall, this configuration has another beneficial feature: the sound rises and blends before projecting outward towards the audience, generating an homogenous sound.

The Modern Tenor Horn vs. the Original

The modern tenor horn comes predominantly in two basic shapes: with the beginning of the bell tubing looping over top of the valves, a configuration normally associated with the cheaper models, and with the tubing wound once to leave the valve keys standing above the bell tubing, a trait normally associated with the more expensive models.

The difference between these versions of the tenor saxhorn and the original lie mainly in the lead tube and bell-design. The original’s lead tube went directly into the first valve, then straight down once out the other side of the valve casing, shortly curving upwards, tracing an arc approximately 6.5" (17cm) across, with the bell extending both higher and lower than the modern version, sketching out a shape like a “b,” with a flared top.

The modern tenor horn retains this general shape, but in compacted form, as the lead pipe goes directly to the valve casing, passes through, then straight down once out the other side, but this time, after dropping perhaps 10" (25cm), loops upwards once more, traces an arc of approximately 5" (13cm), drops down approximately 15" (38cm) before bending upwards, tracing an arc of approximately 6.5" (17cm), rising and ending at the bell.

This design greatly shortens the height of the horn, whilst retaining all of the horn’s performance characteristics and intonation. Of added benefit is the fact that the instrument is more compact, easier to carry and transport, and is less prone to becoming damaged.

The bell of the modern Saxhorn also differs from the original, which more resembled a long, narrow cone ending in a small flare. The modern bell is wider, the bell tubing narrower towards the end.

NOTE: The above numbers are only general averages, as there are many designs and shapes out there.

Other Forms of the Tenor Horn

The bell-forward design, though made sporadically and in small numbers, especially since circa 1910, is still very much with us today. The bell forward design was sometimes referred to as a "solo" horn, which is a reference to the British Brass Band tradition of referring to the principal tenor horn player as the "soloist." The idea was for the soloist to be able to better project towards the audience.

In the late 19th century, there were instruments whose makers billed them as being circular alto or tenor horns, but based upon the design of these horns, I think it can be safely said that this represents a misuse of the term *alto* or *tenor horn*, as the bore, taper and bell design are not a match.

Some companies, like F. E. Olds & Sons, made tenor horns with directional bells that could be turned and, by means of screws, locked into place.

Olds Alto Horn

Not all tenor horns are pitched in E flat. A percentage of the aforementioned Olds tenor horns were F horns that came with an E flat crook.

Besson Sovereign

It is not presently certain as to how long F tenor horns have been made, but examples have been seen commonly since circa 1900.

The Tenor Horns of Today

Antoine Courtois has been manufacturing tenor horns since winning a lawsuit against Adolphe Sax in 1855 for the right to manufacture Saxhorns. Their horns are among the finest, right along with the Besson Sovereign.

Other manufacturers are: Amati, Bach, Cerveny, Kanstul, Yamaha.

The History of the Baritone

The Modern Baritone Vs The Original Tenor Saxhorn

Courtois Compensating Baritone

Like their Saxhorn progenitors, there are two versions of the modern baritone, formerly called the Bb tenor horn and the baritone (the latter of which is often mistakenly referred to as the euphonium). The original Saxhorns, both of which were Bb tenor instruments, were less wound and much taller, and sketched out a shape like a "b," with a flared top.

Both modern baritones retain this general shape, but in compacted form, being wound in both lead-pipe and bell tubing. As with other members of the Saxhorn family, this design greatly shortens the height of the horn, whilst retaining all of the horn's performance characteristics and intonation. Of added benefit is the fact that the instrument is more compact, easier to carry and transport, and is less prone to becoming damaged.

The bell of the modern Saxhorn also differs from the original, which more resembled a long, narrow cone ending in a small flare. The modern bell is wider, the bell tubing narrower towards the end.

The Two Bb Tenor Saxhorns

Nothing in the history of brasswinds has served to confuse so many so thoroughly! Initially, when it came to writing a piece on the two versions of the Bb baritone, I skirted the issue of the two Bb tenor instruments in order to avoid dealing with all the misinformation floating around out there. However, merely by raising the name "baritone" and omitting any reference to the Bb tenor horn, this in itself served to draw attention to the issue. So in response, here is the short version of what these two instruments are all about:

In the US, especially within organizations dedicated to the preservation of 19th band music and instruments, the terms *baritone* and *tenor horn* are used in their original form. After all, this is how they appeared in Sax's own catalogues.

In the UK, the term *alto* was dropped, even though the little Eb horn was originally advertised in Sax's catalogues as an *alto horn*. The reason this was done is that in British brass bands the Eb cornet is referred to as the *soprano*, the Bb cornet as the *alto* (unsaid but implied), the Eb horn as the *tenor*, the small-bore Bb horn, formerly the *tenor horn*, became the *baritone*, the baritone mysteriously disappeared from the Saxhorn lineup, and so on. The name *tenor* could apply only to one instrument, of course, and as it had been reassigned to the Eb horn, this meant that the large-bore Bb instrument got stuck with the same name as its small-bore counterpart, though it was relegated to the concert band, not the brass band lineup;

an act which ended up creating two bodies of information and experience that both fell under the heading “baritone”.

Upright Saxhorn

To further confuse the issue (if that were possible), the euphonium is often referred to as the *baritone horn*, which in the minds of players creates an unwarranted association between that instrument and the Saxhorn family of instruments. The euphonium, however, is a member of the tuba family, as it shares the tuba bore-profile with its larger counterparts.

In general appearance and size, the small-bore baritone looks much like the Eb tenor horn. Tone-wise, it has a crisp, brassy sound, reminiscent of a trombone. In comparison, the large-bore baritone has a softer, more diffuse sound, that lies somewhere between the small-bore instrument and the euphonium in sound-quality.

Other Forms of the Baritone

The over-the-shoulder Saxhorn design was a common sight from circa 1850 to circa 1880, and was a staple of marching bands, especially in the United States.

Over-the-Shoulder Bb Tenor Saxhorn

Because the modern military-style band no longer marches at the front of columns of soldiers, due to the invention of motorized transport, the modern marching version of the baritone is a bell-forward instrument, in general shape like an oversized solo tenor (alto) horn.

Some of the finest modern baritones come with the compensating valve system, which delivers better intonation and more stable and truer pedals.

The Baritone Horns of Today

Yamaha Marching Baritone

Antoine Courtois has been manufacturing baritone horns since winning a lawsuit against Adolphe Sax in 1855 for the right to manufacture Saxhorns. Their horns, especially the compensating model, are among the finest. Other present-day manufacturers are: Amati, Bach, Besson, Blessing, Holton, Kanstul, King, Winston, Yamaha.

The History of the Euphonium

Euphonium

Though Sommers of Weimar is credited with inventing the Euphonium circa 1843, this instrument represents the culmination of earlier experiments dating back as far as circa 1820. Like the tuba, the euphonium is an instrument possessed of great range- about four full octaves in the hands of a player capable of making full use of its attributes.

Some consider the euphonium to be a B flat tenor tuba; others claim it to be a tenor or baritone Fluegelhorn; still others have mistakenly claimed that the euphonium was a Sax invention, or a derivation of a Sax instrument.

Since Fluegel instruments have a comparatively limited range, marked by instability and general lack of responsiveness in the third octave (this includes all Fluegelhorns, ballad horns, vocal horns, Koenig horns, and related instruments), and since the tuba, like the euphonium, has a far greater range than most brasswinds, the tuba connexion seems most plausible.

The Sax connexion is erroneous because it is based upon a miscomprehension of nomenclature. The tenor Saxhorn is today called the baritone, and even today's euphonium is often referred to as the baritone horn. These terms also serve to confuse the distinction between these two instruments.

Because the circa 1820 tenor basshorn incarnation of the euphonium is coincident with the early addition of valves to brasswinds, a connexion with lower-voice conical bore brasswinds is inferred, placing this instrument in the category of a valved, as opposed to keyed, ophicleide, making it an early 19th century incarnation of the Serpent. This, too, places the euphonium in the tuba, rather than the Fluegel camp.

Immediate Popularity

Because of the euphonium's big, pleasing, transparent tone and wide range, spanning from tenor to bass registers, the euphonium was an immediate hit with performers, band directors and composers alike. For the composer\arranger, the instrument is as forgiving range-wise as it is expressive; for the performer, it can handle all or more than the performer demands of it; for the band director, the euphonium represents a large, flexible piece of the overall tone-palate.

The Name of the Instrument

There are two possible meanings for the Greek-derived name this instrument bears: "sweet voiced" or "great voiced." It is quite possible that both versions were implied, by someone well-versed in the Greek language.

The Various Incarnations

The euphonium has often been a compensating instrument since 1874, when the Blaikely compensating system was employed.

There have been helicon (bombardon) and oval incarnations of the euphonium.

Conn 5-valved Double Bell Euphonium, 1902

The euphonium has had as many as five valves, both rotary, piston, and combinations of the two. The valves have been placed in line, at an angle, in separate groupings of three and two or three and one, and the valves have been placed on the horn in a variety of locations.

The euphonium has been built with the bell variously straight-up, forward facing, directional, slightly flared like a Saxhorn, widely flared like a Sousaphone, and side-facing.

The double-bell euphonium came with both fixed and directional bells, or with one fixed and one directional bell, most often with the smaller bell forward-facing. The smaller bell was said to have been contrived to cover the sound of the valved trombone, but as the trombone is a cylindrical-bore instrument, this claim, if true, is based on a misconception. The closest brass member this sound could hope to emulate would be the baritone\tenor Saxhorn.

The euphonium also comes in marching form, shaped like an over-large cornet.

Kanstul Marching Euphonium

The History of the Trombone

From The Sackbutt To The Present

Tenor Sackbutt by Latzsch

Given the best evidence, which by all accounts is very much incomplete, the earliest trombone, called the sackbutt and similar names in England, seems to have emerged from Belgium circa 1450. Though the earliest examples of this instrument date to a century later (circa 1550), direct references to musicians and their instruments, and surviving artwork, both establish the existence of the saxbutt circa 1450.

The bells of these earliest instruments terminated in a rimless funnel little wider than 5" in diameter (13cm). Like the modern trombone, these were a tenor instrument, and by the early 17th century there was an alto, a bass and a contrabass version.

These early instruments often came with a variety of crooks, to lower the pitch a tone or more, or in some cases to drop the range of a particular instrument to the next register.

These early instruments were known to have been used to accompany church music, and to have played parts in bands, though parts for these instruments were rarely scored. The evidence suggests that the players of these instruments read from parts that, though not written specifically for these instruments (or any other), were nevertheless intended to be part of the performance practice of the day.

The addition of trombones to the orchestra began in the 18th century, though their most popular role was as vocal support for the sacred music of the church, a tradition which continued until at least the mid-19th century. An excellent example of this type of scoring can be found in such music as Fanny Mendelsson-Hensel's Oratorio based upon scenes from the Bible. Gluck, Gossec and Mozart wrote passages for the trombone intended to be spiritual or supernatural; Gluck commonly used three members of the trombone family- altos, tenors and basses.

By the mid-19th century, bell-size became wider as a larger, louder sound was desired, for performance in bands, and to generate greater volume in orchestras which were continually increasing in size. Composers like Berlioz and Wagner relied heavily on trombones for bigger volume, and a far greater range of emotion

expressing might, heroism, barbarism, religious fervor, and, it must be admitted, the spectacle of sheer volume for its own sake. This no doubt prompted Richard Strauss to utter the famous quote, “Never look at the trombones … it only encourages them.”

By this time, though the role of the trombone in band and classical music was pretty much set, by the end of the 19th century the trombone found itself in the hands of early jazz musicians, in New Orleans, USA. The various types of jazz were: New Orleans jazz (1870's to the 1920's), Ragtime (circa 1890- 1930), what some called the Jazz Era (1910's-1930), the Big Band or Swing Era (1930's- 1940's), the Be Bop Era (1940's- 1950's), the Avant Guard Era (late 1950's), Free Jazz (late 1950's), and Fusion (1960's-1970's).

In early jazz the trombone played a more or less functional role, and was usually present as a single instrument. Early jazz bands consisted of a wide variety of instruments, but by the 1930's became more or less standardised, consisting most often of four trombones, four saxophones, four trumpets, and the rhythm section which was made up of bass or tuba, drums, piano, and guitar or banjo.

One soloist of particular note, Tommy Dorsey, was the first to play the trombone as a singing, lyrical solo instrument- a far cry from its more Wagnerian association of the previous century.

The Trombone Family

The trombone of today comes generally in five ranges: soprano, alto, tenor, bass and contrabass. Special order instruments, such as the piccolo and the sopranino trombone, are known, though their use is generally relegated to trombone bands. The soprano trombone is often referred to as a slide trumpet, but there are internal differences between the two instruments.

Until recently, many believed that the soprano trombone was an historic instrument, but it has recently come to light that this is not the case. For the whole story, read The Soprano Trombone Swindle, at:

http://www.trombone-society.org.uk/soprano.htm

For a peek at one of the finest trombone collections in the world, and the complete trombone family, visit Tom Izzo’s site at:

http://www.geocities.com/Vienna/Studio/7875/Instruments.html

The most generic keys for the trombone are or have been: the soprano in B flat, the alto in G, F or E flat, the tenor in A or B flat, the bass in B flat\F, D or G, and the contrabass in BB flat.

Trombone Forms and Configurations

The lowest four voices of the trombone have all been made with valves, including and not including a slide.

In the 1870's, Adolphe Sax and other instrument builders made a six-valve trombone, where the six valves, manipulated by both hands, corresponded to the six slide positions.

Van Englen 6-valve, 1893

Two-hundred years earlier, the logistical problem in making a contrabass trombone was solved by introducing a double slide, though other less practical versions came with a long handle attached to the slide grip.

With the introduction of rotary keys and pistons in the early 19th century came trombones that could trill, change register and transpose.

In the 1950's, King (H. N. White, Co.) made an instrument called the “trombonium,” which, while not exactly a trombone, is similar enough to one in bore profile to sound like a valve trombone.

King Trombonium, 1955

The Roles of the Less Common Instruments

Miraphone Contrabass

The life of the soprano trombone has been patchy at best. It saw wide use in orchestral music in the late 18th century, but was edged out in the 19th century, first by keyed, then valved instruments.

The problem of maintaining interest in this instrument lies partly in available repertoire that explores this instrument’s capabilities. The scarcity of this instrument is directly proportional to the lack of effort in creating a repertoire and venue for it. That said, interest in the soprano trombone is rekindled from time to time. It is a little known fact that the soprano trombone was played by some of the top trumpet/cornettist players of the jazz world in the 1920's, such as Freddie Keppard. Louis Armstrong was photographed with this instrument during his tenure with Joe “King” Oliver’s Creole Jazz Band when they were playing at the Lincoln Gardens, though my understanding is that this was a promotional shot. Today, Jupiter produces a cheap version of this instrument under the name “mini

trombone." DEG (Getzen) made a model in the past, and Miraphone is still producing their version.

The alto trombone is still used in its original capacity of playing and performing period music, but it can be used to replace the Horn, contralto trumpet, tenor (alto) horn, tenor clarinet and alto saxophone. At present, it is enjoying a tremendous resurgence in popularity, and most of the major manufacturers are now producing alto trombones.

The contrabass trombone, though used primarily to play and perform rare parts scored for it, can be effectively used as a substitute for tuba in classical music and period jazz, and bass saxophone in period and modern jazz.

The Meaning of the Two Names

The exact etymology and meaning of the term "sackbutt" and it variations is not certain, but is thought to be a derivation of the Old French term, *sacquer*, "to draw out." The word "trombone" has meant variously *trumpet* or *large trumpet* in German and Italian.

The History of the Tuba

The tuba, as we all know, is a big instrument. The *subject* of the tuba, as it turns out, is even bigger. It all begins with a peculiar-looking Mediaeval instrument made of wood and leather that was redesigned a number of times, first gaining keys, a straightened wood or metal body in two sections and even more keys, an upright configuration of graceful, wound tubing and valves, a circular design resembling a snake once more, and eventually culminating in the 4-valve BB flat compensating behemoth we all know and love today.

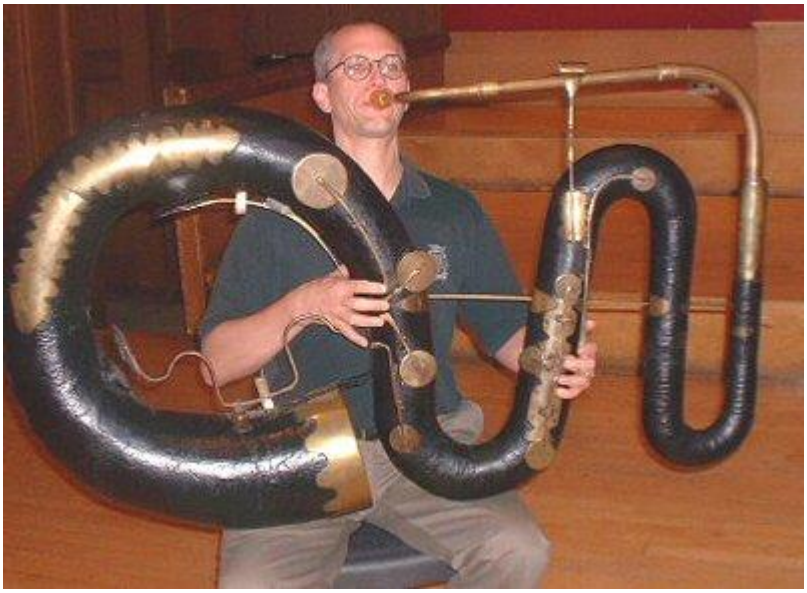
The tuba is an instrument for which there was a demand long before its creation. Various inventors sought to fill the desire of composers, bandmasters and orchestra conductors for an instrument that could supply the bottom end, especially in the days when orchestras were growing exponentially in size. Hector Berlioz' remarks concerning the serpent and ophicleide are well-documented and uniformly uncomplimentary. To do these instruments justice, however, Wagner, who loved a lush tone-palate, wrote supporting passages for the serpent, and demand for the ophicleide remained such that it lasted until the early 20th century.

Though this researcher can never hope to do justice to this instrument in so short a piece, it nevertheless is my hope that this overview will provide the basis from which to form meaningful direction and questions in the minds of those who wish to know more about this instrument, its origins and related instruments.

The Serpent

The serpent was invented in France by Edme Guillaume ca 1590. Though metal versions exist, the original and most predominant materials this instrument was fashioned from was wood covered with leather. The mouthpiece was variously made of wood, bone, ivory, oxhorn, ceramic, and various metal alloys such as brass, bronze and pewter.

Doug Yeo playing the Anaconda



The original serpent, coiled back and forth like a snake, was played by means of six holes. Later on, keys were added so that this instrument could play with greater facility.

This instrument saw wide use in the church as a bass accompaniment for religious music that had evolved from Gregorian Chant. The earliest known composers of this form were Leoninus and Perotinus, or Leonin and Perotin, in the 12th century. The composers Leoninus and Perotinus are critically important to us because they are the first two recognised composers of Western Music: for the student of Western Music, it all begins with them.

In Britain, besides its sacred role, the serpent was soon adopted as the bass member of military wind bands.

Down through the centuries, the serpent proved remarkably resilient to sweeping change in instrument design. Though it was redesigned several times and adapted for modern use, the original instrument managed to hang on, and is still with us today, kept alive by various groups and collectors with a keen interest in this venerable old instrument.

Composers like Beethoven, Mendelssohn, Berlioz, Meyerbeer and Wagner were no stranger to the serpent, and even today, composers in search of interesting sounds to compliment their tone-palate, will occasionally score solo parts for this 400-year-old relic.

The largest version of this instrument, the contrabass *Anaconda*, appeared belatedly in 1840, and is now part of the collection of the Edinburg University Collection of Musical Instruments.

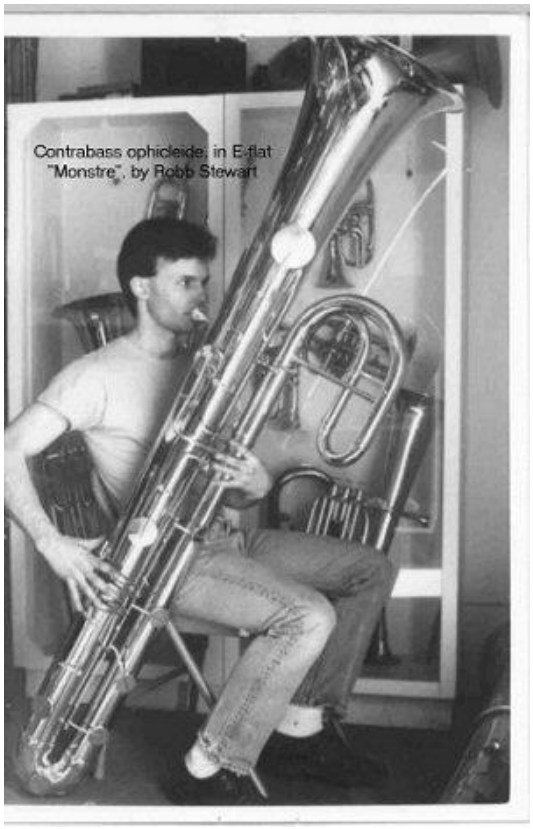
The Ophicleide

In 1810, in Dublin Ireland, bugle-maker Joseph Halliday created the keyed bugle, the progenitor of the modern cornet. He based his design upon the keyed trumpet, an instrument that had been around since the late 18th century. In 1821 he created the ophicleide, the name being constructed from the two words “ophis” (Greek for “serpent”) and “kleis” (for “stopper” or “cover”).

Though the ophicleide bears no resemblance to its progenitor, being made of brass, having keys and pads like a saxophone, and standing upright, what matters here is its less obvious *internal* design. It is a brasswind of conical bore utilizing holes that, when covered or uncovered, change the pitch of the instrument.

If the appearance of the ophicleide is reminiscent of the saxophone, there is good reason for this. The saxophone was but one of several attempts to fuse ophicleide and woodwind design. In fact, Sax’s earliest saxophones were often refered to as the *ophicléides á clefs*, or the *ophicléides á clefs et á bec*.

Robb Stewart playing the Ophecleid



Adolphe Sax was by no means the first inventor to attempt this. Other fusions of ophicleides and woodwinds, with single and double reeds, predate Sax's efforts. In fact, when he first introduced the progenitor of the modern saxophone at a Paris exhibition, another inventor had brought a very similar instrument. Because Sax's instrument was far superior to its competitors, the competition was soon routed, but in typical Sax fashion the authenticity of his invention is doubtful.

The ophicleide all but swept aside its predecessor, but the plucky serpent managed to hang on, whilst the ophicleide finally expired in 1928, though it has recently been resurrected, and faithful replicas are once again available.

The largest version of the ophicleide is the contrabass *Monstre Ophicleide*, built by Robb Stewart, an expert at making replicas of 19th century brasswinds.

The Bass Horn

The Bass Horn

Another variation on the serpent, the earliest bass horn I am aware of was manufactured circa 1800, predating the ophicleide by about twenty years. I am as yet uncertain as to the origin of this instrument, or who its inventor was, but this early example comes from England.

The Russian Bassoon

The Russian Bassoon

The Russian bassoon, despite its name, is actually a Belgian-made instrument of serpent configuration consisting of two wooden tubes joined at the bottom. It was invented circa 1820

The Helicon

The helicon, thought to have been invented in Russia circa 1845, was designed to be a marching horn, carried on the shoulder. This bass instrument was the forerunner of the Sousaphone, which is the self-same instrument with a directional bell grafted on. In 1850, Ignaz Stowasser of Vienna produced large numbers of these instruments for cavalry and infantry bands.
The helicon was very popular across Europe and in the United States.

The Helicon, 1870

The Tuba

The tuba proper was first patented by Prussian bandmaster Wilhelm Wieprecht and German instrument-builder Johann Gottfried Moritz in 1835. This instrument was soon adopted by British brass bands.

Tubas come in a number of keys: BB flat, CC, E flat, F, and GG, though the tuba is what is called a “non-transposing” instrument, as its music is read and played in concert pitch.

There are many design configurations for the tuba. The compensating valve design allows the playing of true, pure pedals that are in tune; Miraphone’s tuba, held almost in the transverse position, has four rotary keys; the bell can be forward facing or up; they can have up to five valves, either in-line or with the extra two strategically placed for the left hand; bell diameter can vary from 37-74 cm (15-30 inches); they can be built of brass that is often electroplated with silver, nickel or copper, or they can sometimes have bells of plastic or fibreglass; the bell tubing can we wide and open like a funnel, or relatively small, ending in a large bell.

Though the tuba has a conical bore, its profile is not that of the bass Saxhorns, which are members of the cornet à pistons (cornopean) or valved bugle family. The tuba has a wider conical bore profile and deeper cup mouthpiece.

The original Wieprecht\Moritz instrument, like its Bombardon (helicon) analogue, was an F instrument.

The Bass Saxhorns

The Courtois Saxhorn

By 1843, Adolphe Sax had begun manufacturing Wieprecht-Moritz-type tubas in Paris. His work on the tuba, however, was a limited, secondary matter compared to the brasswinds that bear his name. His apparent intent was to create an integrated family that included the entire range of the various diverse brasswinds. To accomplish this he selected a single archetypal design upon which all of his instruments were based. That underlying design is the bore profile of the valved bugle or cornopean, the predecessors of the cornet.

This means that the Eb bass Saxhorn brass instruments have a narrower bore and smaller bell profile than the tuba.

The Sousaphone

The Sousaphone, alleged to have been first made by C. G. Conn in 1898, was actually first manufactured by J. W. Pepper in 1893, where it was displayed at the industrial exhibit in Philadelphia that same year.

JW Pepper's Original Sousaphone, 1893

http://www.jwpepper.com/history/sousa.html
http://members.aol.com/ncpmb/sousaphone.htm

As previously stated, the Sousaphone is really just a helicon with directional bell grafted on. Rather than being made at Sousa's suggestion, the opposite is actually true- that J. W. Pepper suggested the design to John Philip Sousa. In fact, the original J. W. Pepper Sousaphone is still in existence

The Compensating Valve System

The Courtois Compensating Tuba

The compensating valve system was invented by D. J. Blaikely in 1878. It is designed to extend the range of the instrument, whilst stabilizing the pedals' pitch. The basis of this principal is that when two or more pistons are used at the same time, the combined length of tubing serves to correctly adjust the pitch. To understand this concept, one must consider that the length of tubing added by opening each piston is not that of a perfect interval. Each interval is actually a bit sharp, which is necessary when it comes to playing an equal-tempered scale. The natural scale, especially of a conical bore instrument, is actually flat, each scale having its own unique arrangements of perfect intervals, such as perfect seconds, thirds, sixths and octaves. While it is not possible to freely modulate while using natural intonation, the sound, called "just intonation," is absolutely gorgeous.

Victor Mahillon further refined this system circa 1886 with his “automatic regulating pistons” design.

The Wagner Tuba

The Wagner Tuba

The Wagner tuba comes in two forms- the smaller 4-valve F\B flat horn which has roughly the same range as the Horn and Tenor (alto) horn, and the larger B flat bass horn. The F horn uses a “French” horn mouthpiece, whilst the bass version uses a correspondingly larger mouthpiece. Both can best be described as falling somewhere between a Saxhorn and a “French” horn in bore profile.

The Wagner tuba has a bell with almost no flare, and the entire bore, including though the valves, is conical, which together serve to impair the instrument’s output, which no doubt in turn curtailed this instrument’s chances of gaining widespread popularity.

The smaller F Wagner tuba, like the F contralto trumpet, is still widely popular in Europe, however, but as a staple of small brass ensembles. New improved models of both versions of this horn, of high quality, are today being manufactured by Hoyer, fine makers of “French” horns.