The Modern Tuba:
The Evolution of the Instrument, Key Compositions and Extended Techniques

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Leiðbeinandi: Áskell Másson
2014
Abstract

The primary goal of this paper is to study the use of the tuba in contemporary music through the history of its repertoire, the evolution of the instrument, and to explore the extended techniques specific to the tuba.

In the process of choosing a piece to perform one should ask them how, why, and when it was written. This paper will focus on the historical evolution of the tuba from the Serpent to the Ophicleide concluding with the transition from to the bass tuba.
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The History of the Tuba: Predecessors

Serpent

Before the modern tuba became what it is today, it went through several modifications and stages, throughout history as different resources became more readily available and industrial innovations occurred. One of the earliest examples predating the modern tuba is the serpent.

The serpent was invented in 1590 by Edme Guillaume, a singer in the Auxerre Cathedral. The serpent was invented in order to assist with balancing the lowest male voice in the choir. This setting became very popular and the serpent was used for many years until more suitable instruments were invented. ¹

The six holes in the body of the serpent allowed the player to lengthen the instrument and therefore create different pitches. Playing a serpent with all of the holes covered would emit a C below the bass clef, which is the lowest possible pitch on the instrument. The upper register is only limited by the capabilities of the performer.

Many sought to improve the serpent because of the instruments high popularity in the 17th and 18th centuries. The most important of these innovations was the addition of keys and more holes to the instrument and the covering of some of the holes with keys so a player could more easily move between pitches.

Berlioz about the Serpent:

The fundamentally barbarous sound of this instrument would have been much more at home in the bloodthirsty rituals of the Druids than (those of the Catholic church, where it is always in evidence, a monstrous monument to the stupidity, tastelessness and clack of feeling which have guided the functions of music at divine service in our churches since the time immemorial. An exception must be made for occasions when the serpent is used to double the awesome *Dies Irae* plainchant at Requiem mass. Its cold, horrible bawling is doubtless appropriate there. It even seems to assume a kind of poetic misery as accompaniment to those words embodying all the horror of death and the vengeance of a jealous God. This implies too that it would be well suited to secular music concerned with the expression of such ideas – but only for that. Besides, it blends poorly with other orchestral and vocal timbres. As the bass line to a wind section the bass tuba and even the Ophicleide are much to be preferred.²

Ophicleide

The Ophicleide was invented by Jean Hilaire Asté in 1821. The name roughly translates to “keyed serpent” in Greek and was a direct predecessor in the evolutionary path from the serpent. The Ophicleide shares a close resemblance with the baritone saxophone because of the register it sounds in, the key mechanisms, and timbre.³

![Figure 3, Ophicleide](image)

One of the first known uses of the instrument was in an orchestral setting. The Ophicleide was used in the low brass section as the lowest pitched brass instrument in Hector Berlioz’s *Symphony Fantastique*, which features two ophicleides.

![Figure 4, Dies Irae from Sym. Fantastique](image)

The Ophicleides take a primary role in the piece, and although they tacet in the first three movements, the Ophicleides are the first to present the Dies irae motif in the 5th movement.4

**Bass Tuba**

The bass tuba first came to life with patent no. 9121 earned by the Prussian instrument makers F.W. Wieprecht and J.G. Moritz for a “basstuba in F1”.5

The patent dated September 12, 1835 describes the bass tuba as the lowest instrument of the orchestra and military band, and contained one of the largest ranges of all of the brass and woodwind instruments during this era.6

Below is Wilhelm Wieprecht description of the bass tuba:

“...this would surely indicate how important and advantageous for music is the invention of the chromatic Bass-Tuba, which can descend one octave lower than the serpent and English bass horn, and six notes lower the ophicleide, while yet retaining the high notes of these three said instruments.” 7

The bass tuba had 5 Berlin valves, the first three of them operated by the right hand and the other two with the left hand.

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6 Bevan, 513.

The initial use of the bass tuba was in military bands, which Wieprecht conducted. Wieprecht introduced two bass tubas to each of the Prussian military bands. Only after the use of tubas in bands had become more popular, was the tuba introduced to orchestras. The tuba was introduced originally as a substitute for the Ophicleide in Berlioz’s and Mendelssohn’s music and later as a standalone instrument in Liszt’s and Wagner’s music.

Berlioz wrote about the tuba in his *Treatise on Modern Instrumentation and Orchestration*:

> The bass tuba is Nowadays very widespread in the north of Germany, especially in Berlin; it has an immense advantage over all other low wind instruments. Its timbre is incomparably nobler than that of Ophicleides, bombardons and serpents, and has something of the vibration of the timbre of a trombone. It is less agile than the Ophicleide, but its tone is powerful and its range in the lower part is the most extensive available in the whole orchestra.8

The role of the tuba in orchestra and band during the 19th century was mostly as an accompanying instrument. There is no evidence of any solo music written for the tuba alone or with piano and the only available solo music for tuba in the 19th century was for tuba accompanied by brass band. This was likely the case because the tuba was such a young instrument and composers were not yet sure of its capabilities.

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The piece is named *Olosabut* (tuba solo spelled backwards) and it was written for tuba and brass band by Pettee in 1885.\(^9\)

**Wagner Tuba**

The Wagner tuba is named after Richard Wagner who championed the idea of building an instrument that closed the harmonic gap between the tuba and horn and it has a different sound from a trombone and trumpet.

It is worth mentioning that since the receiver of Wagner tuba is intended for small bore mouthpieces, the same as in French horn, horn players are the ones who play Wagner tuba and not tuba players.

In 1853 instrument maker Adolph Sax had created an earlier version of what became the Wagner tuba and shared his design with Wagner.

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In 1862 Wagner met with famed instrument maker Alexander about the idea for this instrument and ordered a complete set. Several years later Alexander provided the set to Wagner. Wagner was not satisfied with the product and as a result he ordered a set of small bore tuben from Carl Moritz, son of J.G. Moritz who invented and patented the first tuba.10

The Wagner tuba was later used in the Ring Cycle as well as Bruckner’s 7th and 8th symphonies. Bruckner uses a quartet of Wagner tubas, 2 in Bb and 2 in Basso F.

Stravinsky features the Wagner tuba in his piece Rite of spring, in “Ritual of the Rival Tribes”, the special tone quality of the beastly Wagner tuba comes out.11

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10 Bevan, 461.
Composers who wrote for the Tuba

Berlioz

When Berlioz took his music to be played by different orchestras in Europe and other instruments were not available to him, he had a unique opportunity to use the tuba instead of the Ophicleide. After the initial trial, Berlioz fell in love with the instrument.

I was offered as a substitute a bass tuba a magnificent instrument of which I shall be speaking in connection with the military bands of Berlin.\[12\]

Since then, Ophicleide parts mostly were written by Mendelssohn, Berlioz, Verdi and Wagner, are traditionally played on the tuba.

In 1846 Berlioz wrote his first part for the bass tuba in the piece The Damnation of Faust. Below is an excerpt from the work that is commonly asked in tuba auditions today.

Marche Hongroise.
Ungarischer Marsch. Hungarian March.

Figure 8, Hungarian March

\[12\] Bevan, 208.
The first time a part was composed with the bass tuba specifically in mind was by Franz Liszt in his *Concerto in A for piano*. He first started writing the draft in 1840, approximately 5 years after the bass tuba was patented. Liszt was born in 1811 which puts him at 24 when the bass tuba was patented and right about 30 when he started writing the draft for his piano concerto at the midst of his virtuosic career. Liszt premiered the concerto in 1857 and conducted by himself. The part was played by Hans von Bronsart.\(^\text{13}\)

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\(^\text{13}\) Chicago Symphony Orchestra program notes. 
http://cso.org/uploadedFiles/1_Tickets_and_Events/Program_Notes/052710_ProgramNotes_Liszt_Piano
Concerto2.pdf Accessed on 31/7/2014.
Wagner

During the time when performers were shifting from Ophicleides to tubas, the main Ophicleides used were the C, Bb, and rarely the Ab, which was gaining popularity (as noted by Berlioz in 1844 in his Treatise on Instrumentation). Because the C and Bb were standard, the lowest possible note was an A natural unless an Ab Ophicleide was used in which case a G could be performed.  

Wagner composed the opening to *Eine Faust Overture* in 1839-40. The piece has a low G#, which would have only been playable on the newly invented bass tuba or the rarely used Ab Ophicleide.

Wagner putting the tuba in a solo role with the string basses to open the piece may have demonstrated the sound of the instrument to other composers, leading to a largely expanded role for the instrument in standard repertoire.  

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Tuba in Brass Quintet

The genre of brass quintets is as new western music as the tuba is.

In 1850, composer and violinist Jean Bellon published the first ever music written for brass quintet, it was a set of 12 quintets in sonata form and was published in Paris by Richault.  

These 12 quintets were written for: 1 small flugelhorn in Eb (or trumpet, or piston-valve cornet in Bb/A), a piston-valve cornet in Bb/A, a horn, a trombone and an Ophicleide (in Bb or C), which makes it the first brass quintet ever composed, but not the first one to written specifically for the tuba, rather it was written for the Ophicleide which was replaced by the tuba later.

Approximately 60 years later Victor Ewald completed his four brass quintets. These were composed in 1888 and finished at 1912.

In 1954 the first professional brass quintet was formed with the collaboration of Harvey Phillips (Tuba) and Robert Nagel (Trumpet). With this, a new musical entity was born and was named “The New York Brass Quintet.” The goals of the quintet were to develop the audience for brass quintet concerts and to promote composers to write for brass quintet.

Figure 11, New York brass quintet

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History of Solo Works

Influential solo works

The second half of the 20th century brought some of the most significant events for the development of the tuba repertoire. It was Ralph Vaughan William’s *Concerto for Tuba* that debuted the tuba as a solo instrument in large concert halls for the first time since the tuba was invented.

On June 13th, 1954 the concerto was premiered by Phillip Catalinnet, Principal Tubist of the London Symphony Orchestra. 19

A couple of years earlier in a “prophetic” article published by a Londonian magazine called *Music*, a piece called *Tuba* has been published:

> Maybe the future holds some faint hope for ambitious players. Some more satisfactory employment of their talents as expressed through the Bass and Tenor Tubas? Perhaps composers can be encouraged to make a serious study of the possibilities of these instruments and to compose music for them that will be an expression of their own genius? If this can come to pass then the day of the tuba player will dawn. Recitals at the Wigmore Hall! Appearances in the Royal Festival Hall!! The Royal Albert Hall!!! Carnegie Hall!!!! World tours!!!!! Who knows????? 20

This was the first time in history that anyone had performed a tuba concerto, and the tuba was becoming a legitimate solo instrument.

In 1955 Paul Hindemith wrote his *Sonata for Tuba and Piano*. Hindemith was already a well-known composer during this time. Because of Hindemith’s notoriety, writing a solo work for the tuba was a major event for tuba players all over the world. In 1955 he completed his collection of sonatas for wind instruments, the final sonata was indeed written for Tuba and Piano21

In November of 1939 he wrote to his publisher Willy Strecker:

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You will be surprised that I am writing sonatas for all the wind instruments. I already wanted to write a whole series of these pieces. First of all, there's nothing decent for these instruments except for a few classical things….. since I myself have been so interested in playing wind instruments, I have great pleasure in these pieces.  

These first two major pieces, composed at around the same time, served as the base for tuba repertoire from then until today. Both of these pieces have been listed on many professional orchestral auditions and solo competitions.

**The First Full Tuba Recital**

Roger Bobo, one of the most renowned tuba soloists of the 20th century, is considered to be the first tuba player to give a professional tuba recital.

On the 31st of March, 1961, Roger Bobo played the first tuba recital at Carnegie Recital Hall.

For his recital, Mr. Bobo notes that “there was not much repertoire to choose from”.  

The repertoire for the first recital included:

1. Two Arias from the Cantatas by Bach
2. Prince Igor’s Aria by Borodin
3. Sonata for Tuba and Piano by Hindemith
4. Barcarolle et Chanson Bechique by Semler Collery
5. Introduction et Danse by Barat
6. Two songs by Spillman
7. Sonata for Tuba by Wilder
8. Suite Concertante by Russel

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Out of the eight pieces played on this recital, six were written for tuba, and all of those six were written within ten years of that recital. The tuba as a solo instrument was new and composers had just started to take interest in the newly discovered solo opportunities of the instrument.

Figure 12, First tuba recital program.

The recital was a one of a kind special event and was very well received. The next day the following poem named “Recital” by John Updike was found in the New York Times: “Eskimos in Manitoba,

Barracuda off Aruba,
Cock an ear when Roger Bobo
Starts to solo on the tuba.
Men of every station-Pooh-Bah,
Nabob, bozo, toff, and hobo-
Cry in unison, “Indubi-
Tably, there is simply nobo-
Dy who oompahs on the tubo
Solo, quite like Roger Bubo!”
New Music and Extended Techniques on Tuba

After these major compositional events of 1955, new composers began writing for the instrument and began to test its technical limitations. These high demands led to the study and discovery of extended techniques and new possibilities of playing the tuba that were not used prior to 1955.

In this chapter I will explain some of the most popular new music techniques that have been in use in recent years. I will also show examples of their use in common contemporary repertoire.

These new music techniques include: multiphonics, glissando, half valve, extreme range, flutter tongue, vocal sounds and lip beat.

Multiphonics

The wordnik vocabulary definition of multiphonics is: “The sounding of two or more pitches simultaneously, either with the voice, or on an instrument that normally sounds only single notes.”24 When applied to tuba, multiphonics are performed by the humming or singing of one pitch and the playing of another.

The multiphonics technique is not new to the world of music but it is has not been explored on wind instruments as much as on string instruments.25

Multiphonics were used for the first time by horn virtuosos of the 19th century. Weber wrote a concertino for horn and orchestra with a cadenza filled with multiphonics.26

Berlioz also mentions that he had the privilege of hearing a solo trombone performance where multiphonics were used, he indicates that this effect caused the audience to be astonished.27

Encounters II / William Kraft

The first time multiphonics were used in a tuba solo was with William Kraft’s composition *Encounters II* for solo tuba which was written in 1966 for Roger Bobo.\(^{28}\)

![Figure 13, Kraft Encounters II](image)

In this example, Kraft decided to notate the singing notes with an “x” over the note. In figure 9 the player plays middle C and then sings it and plays the bottom notes of Eb and Db. It continues throughout the piece as the performer occasionally has to stop playing (i.e. buzzing) and continue singing and vice versa. This part is especially difficult because the range in which the multiphonics are written gradually extends. This difficulty comes from the need to widen the throat and oral cavity while playing low, while the natural tendency is to do the opposite while singing high. In order to perform this section it is advised to learn both parts alone, and if possible in falsetto for the singing part since it does not as narrow a throat to sing.

William Kraft about the piece:

> Encounters II was written for Roger Bobo in December 1966, and premiered at the “Encounters” concert series in Pasadena in 1967.

> The first thing Roger and I did was spend a day together, during which we engaged in a creative interplay of ideas and exploration of the instrument’s possibilities. The resultant work was, as Roger described it in the liner notes of his second recording of the piece, “higher, lower, faster (probably louder or softer) than any previous work for tuba.

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\(^{28}\) Kraft, William; Encounters II, Editions BIM
From the multitude of techniques that evolved, I chose those which I felt were best suited for a piece that was basically expressive along relatively traditional lines. Certain exploratory techniques were eliminated to suit the aesthetics of the piece - an esthetic wherein I wanted to show the truly musical possibilities of the instrument without delving into effects for their own sake.

I wanted to undertake the challenge of writing a set of variations for a solo player in which he would create the illusion of accompanying himself, sometimes by use of various dynamic levels, sometimes by varying pitch registrations, and especially by utilizing the voice while playing.  

**Conquer / Ben-David Richmond**

*Conquer* by Ben-David Richmond was written in 2013 and includes an extensive use of the multiphonics technique.

The cadenza of the work features the longest example of multiphonics in the piece, which is written in a cadenza which makes it much more noticeable that the performer is using multiphonics.

![Figure 14, Conquer by Ben-David Richmond](http://www.editions-bim.com/william-kraft-encounters-ii-for-tuba-solo.html), accessed on 15/9/2014.

This section is particularly difficult because the performer is required to cover a large register while singing, ranging from B2 all the way to F-sharp 4. As in the previous *Encounters II* it is wise to sing in falsetto or displace octaves in order to make it possible to perform for the higher

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register. Also notable is that the music is a sequence that keeps going up and each multiphonic measure starts with a strong dissonance. This is difficult to perform because of the strong dissonance between the overtones of the note played by the tuba which clash harshly with the note the player is asked to sing.

Composer Ben-David Richmond writes about this passage:

“Starting in measure 264, there is another example of tuba multiphonics. This multiphonic section is different from the previous one because it is in a cadenza. This leaves more room for interpretation with time, but also for multiphonic vowel sounds. Depending on the line, phrase placement, or volume, the vowel sounds made during the sung multiphonics of this section are left up to the interpretation of the performer.”

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30 Ben-David Richmond, Conquer score notes.
Vocal sounds

Vocal sounds can be described as a sub-section of multiphonics as well as a standalone. Vocal sounds include the speaking of different sounds through the instrument using specific syllables and sounds.

Fnugg / Øyestin Baadsvik

“Fnugg is an improvisation with elements from the Australian Aboriginal instrument didgeridoo and Norwegian folk music. The techniques I use are multiphonics (to sing and play simultaneously) and my own invention "Lip Beat" (percussive tuba). The singing involves active use of syllables. Fnugg is a Norwegian word describing something very small and weightless. Like a snowflake.”

Figure 15, Fnugg by Baadsvik

In the work *Fnugg* by Øyestin Baadsvik, the composer uses the syllables of “O” and “E” often to make a difference in the quality of the sound produced. Baadsvik uses the technique of vocal sounds in the top voice while singing while the bottom voice of tuba playing is playing the same rhythmic pattern as an ostinato. This creates an interesting relationship of 3rds, 5ths and octaves for the duration of the work resulting in a vocal sound multiphonic technique.

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Ursa / Libby Larsen

Another example of vocal sounds is in the work URSA by Libby Larsen, which was commissioned in 2009 by the Falcone as the final round piece.

“Ursa, a composition in two movements, is music from the soul of the bear articulated through the tuba. The first Ursa, a composition in two movements, is music from the soul of the bear articulated through the tuba. The first movement imagines the bear deep in the wilderness, at night, singing to the moon. The second movement places the bear in the same wilderness but at high noon, rustling about in its habitat.”

Measures 78-80 are notated for the tuba player to “GROWL.” The explanation on the bottom of the page explains it further asking the performer to “create the sound of a bear.”

Figure 16, URSA
Libby Larsen writes about this piece:

“...I’ve composed in moments for the performer to create abstract bear language. I invite each performer experiment with this and find a solution which feels right for your own approach to the piece”.

As the composer notes, there is no right or wrong here and the player is invited to experiment to eventually find a solution which feels nice for them and their specific interpretation of the piece.

Extreme Range

Capriccio for Tuba / Penderecki

One of the most common extended techniques used on the modern tuba is the use of extreme ranges - both high and low.

*Capriccio* by Krysztof Penderecki was written in 1980 and is an excellent example of this.

In this work, Penderecki tried to capture the tuba as a “comic essence.” With that in mind, this seems to capture the tuba as an energetic instrument that is always in motion.

![Figure 17, Capriccio by Pendercki](image)

In this example, Penderecki notated the notes as arrows pointing up and down. In the tuba community it is widely agreed that this suggests the performer to play “as high as possible” for the up arrows and “as low as possible” for the down arrows.

Often when this piece is performed it is performed in a sequence such that each chosen high note is higher than the previous (G3). The same goes for the low notes.

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Glissandi and Half Valve

Glissando and half valve are two techniques that complement each other.

On the tuba, in order to play a glissando it is required to push all of the valves on the instrument half of the way, making it possible to go through all of the overtones on the tuba with a glissando.

Capriccio for tuba / Penderecki

In this example from the ending of the Capriccio, after the first few notes (Eb3, D3 and Db3) a line going up and down is scribbled, underneath the line we can see a clear notation for the subdivision of the glissando shape.

![Figure 18, Capriccio by Pendercki](image)

In this register, where the overtones are fairly close together it is required to push all the valves half the way in order to perform the glissando in both ways (up and down) until reaching the high F in the end.

Although, in the 3rd to last note (low A0), it is possible only to bend the note downwards with the use of the throat, widening the oral cavity and directing the air for a lower pitch, this happens because the next overtone underneath the one played now is an octave lower.\(^\text{34}\)

Flutter Tongue

The flutter tongue technique is one that is extremely common on all wind and brass instruments and is one of the earliest known new music techniques. It was first used by composers Pyotr Ilyich Tchaikovsky and Richard Strauss and was written for the flute.  

Flutter tonguing requires the player to interrupt the flow of the air with their tongue, resulting in an aggressive tremolo sound caused by the tongue vibrating and hitting the bore of the mouthpiece.

Alarum / Gregson

In Alarum by Edward Gregson, the composer decides to use flutter tonguing early on in the piece. These results in a quite chilling effect of very rapid articulated high notes on the E4 moving to G4 which sound quite aggressive and mad, Gregson mentions the opening theme shall sound as a call to war.  

Another way that Gregson is notating flutter tongue is on the first time the E4 is played earlier in this example, this time instead of asking for a flutter tongue with an equal speed of articulation throughout the note he is asking for the speed to pick up and the articulations to get quicker, it is notated as following with or without the note heads.  

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36 Gregson, Alarum program notes.  
Lip Beat

Lip beat for tuba was first introduced to the tuba world by Øystein Baadsvik, Norwegian tuba player

“A short rhythmic sound with no specific pitch, like a drum beat. It is based on the tongue movement in double tonguing. To produce a single lip beat, play “TuK”, immediately stopping the air with the tongue. To produce repeated beats, simply continue the double tongue movement with “TuKuTuKu”. The lips should not vibrate long enough to create a pitch, merely make a single “smack” each time the tongue stop the air stream. In this piece there is a high and a low lip beat to imitate the sound of a high pitch and a low pitch drum” 38

Fnugg / Øyestin Baadsvik

“Lip beat started as an experiment. I was playing double tonguing in the low register. Mostly just playing around having fun. I soon discovered that it is possible to add accents to the ongoing double tonguing. This way I could add a musical flow to it. What is extremely important is that it must be very rhythmically steady.

38 Fnugg Score
The technique itself is best performed when using a high internal pressure from the abdominal area and a very loose pressure on the lips.”

39 Øystein, Baadsvik, e-mail message to author, October 20, 2014.
Summary

How Tuba Playing has Evolved, Through the Use of New Music Techniques?

In the short history of the tuba, much has happened and major milestones were achieved. From the acceptance of the tuba as a regular member of the orchestra only a couple of years after it was patented and was first made, to the first solo piece written for tuba about 40 years later, the tuba has been quite a hit and was welcomed by anyone willing to hear it.

The golden age of the tuba started in the 1950s, with the introduction of the new brass quintet medium the tuba and its capabilities were introduced to new audience and especially important to composers who now knew better than before what the tuba could do.

The publication of two of the most important pieces in the tuba literature, The Ralph Vaughan Williams concerto for tuba and the Sonata for Tuba and Piano by Paul Hindemith in 1954 and 1954, respectively paved the golden road of the tuba repertoire and from this point more and more composers have written for the tuba.

The avant-garde impacted the tuba repertoire immensely, starting in 1960’s a series of works for tuba that included different sets of new music techniques never used before on the tuba started to show up, it became an immediate hit and two of these pieces are some of the most important in the tuba repertoire, Capriccio by Kryztof Penderecki and Encounters II by Roger Bobo.

The modern tuba player is a versatile musician as the tuba repertoire of current times is expanding rapidly and demands knowledge of most of the new music techniques mentioned in this paper.
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