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The Drums Throughout Time: Rethinking the Beat

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The Drums Throughout Time: Rethinking the Beat



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Abstract

This paper will examine a variety of ways that drum makers approach their craft by comparing the processes of distinct forms of drum construction as well as the philosophies and aspirations of these artists. This dissertation will review the various choices of drum makers by: (1) providing a brief history of the drum set, (2) comparing the processes of manufacturers, both prominent and independent, and (3) narrating a firsthand project of making a drum with an independent drum builder while incorporating a handmade drum into original compositions and recordings. The paper will also explain the creative decisions of drum makers and how they have reflected the needs of artists throughout history. The motivation that underlies the various techniques will be discussed: that all drum builders are driven by a desire to provide instruments that are musical, extraordinary, unique, and, above all, true works of art. Uncommon approaches to making drums will also be presented to illustrate the diverse range of approaches that assorted drum manufacturers take. Finally, an analysis of the styles and environments that the drummer can perform in will be presented. The needs of the performer inform the construction of the drum and it is up to the drum builder to understand these requirements before the building process begins.

“The most important functions of the early percussion instruments were to assist the dance and to serve primitive magic and ritual. They were symbolic and possessed the power of magic. Few instruments were engaged in so many ritual tasks, or were held more sacred.”¹

Despite centuries of technological advancements, drums continue to evoke the most ancient, primordial reactions that James Blades, a percussionist and author of one of the greatest works on percussion history, describes in the quote above: dance, poetry, music, ceremony, and movement. The body itself was used by our ancestors to make percussive sounds; hand claps, foot stomps, and slaps were methods of making pre-instrumental music.² In efforts to harness and mimic the sounds of the natural world, the gradual incorporation of sticks and scrapers soon followed. Soon everything was an instrument at the artist’s creative disposal: bones, skulls, antlers, gourds, hollow tree branches - if an object could withstand repetitive rhythmic hits, it was fair game.

Today, percussionists of all sorts continue to play and experiment with various sounds, surfaces and textures. But these considerations lead to an interesting question - if all objects carry the capacity for some kind of vibration and sonic manipulation, does the world itself create music? Mickey Hart argues that if music could be defined as an organized series of vibrations, then the natural world produces music and that its rhythms predate not only humanity, but sound itself as sensory input - all objects vibrate at a certain frequency and did so before the conditions for sound (or ears for that matter) even existed.³ All this is to say that anything can be a “drum.”

¹ Blades, James. *Percussion Instruments and Their History*. The Bold Strummer, 2005, pg. 35-42.

² Hart, Mickey. *Planet Drum*. HarperCollins Publishers, 1991, pg. 3-6.

³ Hart, pg. 10-13.

Perhaps this is why evidence of percussion instruments can be traced back so far - they have always been present and their simplicity has remained consistent throughout all of their countless, technological developments. Consequently, the drummer and percussionist have a very unique way of thinking about music - everything is music and almost everything is an instrument: especially things that can be struck, shaken, or scraped.

There is evidence, which consists of cave paintings, specially preserved objects, and literary references, that dates back at least 30,000 years indicating the use of percussion instruments. The earliest percussion instruments were formed naturally within nature. For example, hollowed logs and certain dried fruits are naturally sonorous materials that do not require any additional parts to be added in order to produce resonant sounds. These tools held a special place within dance and hunting rituals. Additional instruments consisted of antlers, bone flutes, and other found objects.⁴

After years of development, the drum set - or the 'traps' (shortened from contraptions) as they were called at the time - came into existence. The origins of the drum set can be traced back to the turn of the 20th century, when the percussionist began to combine particular percussion instruments into a single unit. These initial elements have remained at the core of the drum set to this very day. They include the bass drum, the snare drum, and a cymbal (in some form). At this starting point of the drum set it is evident that the bass and snare drums were very large. This is the case for many reasons: they were played as separate instruments and were initially played in military, marching and classical settings. They were played either outdoors or in great concert

⁴ Blades, pg. 34.

halls and, of course, without the assistance of any form of electronic amplification or enhancement. Furthermore, they were played alongside large ensembles of musicians.⁵

Restrictions of space and funding within the theatre caused ensembles to become smaller and required percussionists to play as many instruments as possible. As a result of this, ‘double drumming,’ a technique where a single drummer plays both bass drum and snare drum by hand, developed and paved the way for the development of the modern drum kit. In 1885, George R. Olney invented a pedal that mounted on the top of the hoop of the bass drum. This early model of the bass pedal was slow, clunky, and mechanically complicated but in 1909, William F. Ludwig developed a more practical footpedal that could even be disassembled and placed in a coat pocket.⁶ In doing so, he had essentially ended the art of double drumming.⁷ Author Geoff Nicholls explains, “The story goes that William [Ludwig], frustrated at not being able to play the fashionable fast ragtime beats, built a footpedal with a spring to return the beater, simultaneously gaining speed and easing the leg-work.” This improvement of the early footpedal allowed the drummer to play faster, more instruments at the same time and incorporate even more percussion to their drum kit.⁸

Drummers began to incorporate instruments from numerous cultures into their drum kit: miniature Chinese and Turkish cymbals, Chinese tom-toms, African cowbells, Chinese temple blocks (woodblocks) and other instruments.⁹ A ‘console’ was also developed which helped mount ‘swan-neck’ cymbal holders, a swing-out snare cradle, and other instruments. A

⁵ Nicholls, Geoff. *The Drum Book*. Backbeat Books, 1997, pg. 8.

⁶ Mulholland, Liam. “Early Bass Pedals: Speed King & Beyond.” *Drum!*, 22 Oct 2012, <http://drummagazine.com/early-bass-pedals-speed-king-beyond/>. Accessed 21 May 2017.

⁷ Glass, Daniel, performer. *The Century Project*. Drum Channel, 2012.

⁸ Nicholls, pg. 8-9.

⁹ Glass, in *The Century Project*.

contraption tray was also placed on these consoles. The ‘traps’ tray provided a space where assorted noisemaker items could be placed. It was the drummers of this period that used these items for Foley effects in silent film theatres.

The hi-hat, shortened from ‘high-hat,’ was introduced later; the extended period over which the hi-hat developed obscures the identity of the official inventor and invention date but the dual-cymbal contraption in its modern arrangement made its first appearance in a Ludwig catalog in 1928.¹⁰ Earlier forms of the hi-hat included the ‘clanger,’ a small cymbal mounted on the bass drum that was struck by a small offshoot arm attached to the bass pedal. This was replaced by the ‘snowshoe’ which consisted of two hinged boards with cymbals bolted to the ends. This device was placed on the floor symmetrically opposite to the bass pedal and was a return to the original method of cymbal playing: one cymbal striking another of the same size, in opposition, on the edge. This device also allowed a drummer to use all four limbs at the same time. Soon after, the first spring operated foot cymbal - called the “low-boy” - was developed. This contraption was very similar to the modern hi-hat except the cymbals were only a few inches off the ground. Eventually, the vertical tube was extended and drummers were finally able to play the cymbal pair with their hands as well as their feet - the modern form of the hi-hat was realized.¹¹

In the 1930s, drummers began to strip away the noise makers. Gene Krupa, one of the most famous jazz drummers of all time, popularized this concept with his seemingly futuristic drum set - his set was sparkly white and consisted of the standard 4-piece setup played today - a

¹⁰ De Douvan, Marc. *THE HI-HAT CYMBALS*. <http://www.marcedouvan.com/en/instru.php?instru=hi-hat>. Accessed 14 May 2017.

¹¹ Glass, Daniel. “Birth of the Modern Hi-Hat.” *Drum!*, 16 May 2013, <http://drummagazine.com/birth-of-the-modern-hi-hat/>. Accessed 14 May 2017.

bass drum, a snare drum, a single rack tom, and a floor tom. Furthermore, it was Krupa who had helped create ‘double-headed’ toms in collaboration with the drum manufacturer Slingerland. His swinging style had demonstrated the importance of the tom-toms and spurred the development of tuneable heads on *both* sides.¹² Prior to this, only one side was tuneable. Chinese tom-toms originally had heads that were tacked on and later forms had tension rods on only the batter side. It was very difficult, if not impossible, to tune or change heads that were tacked on, so this development caught on quickly.¹³

Since all of these instruments were suspended on and around the bass drum, the large marching size was retained - they were usually about 28”x14”¹⁴ - but the drummer could not see over the drums if the newly improved toms were placed on top of these larger bass drums. This started a transition towards slightly smaller kick sizes, and 22”x14” became the new standard kick size. The setups of frequently gigging drummers had to become even more compact and transportable, and, thus, the trend towards smaller drums extended to the extreme with the development of the 18” bass drum. The 18” bass drum has since been established as an integral shell size within what drum makers refer to as the ‘bop size’ setup, which also includes a 12” rack tom and 14” floor tom. Furthermore, this transition to smaller drums transferred the rhythmic focus from the bass drum towards the hi-hat and ride cymbals, resulting in experimentations with larger cymbal sizes.¹⁵

There are many factors that contributed to the decreasing size of the drums but the fact that the drum set was now being played alongside smaller ensembles of musicians - and within

¹² Nicholls, pg. 12.

¹³ Glass, Daniel, performer. *Traps: The Incredible Story of Vintage Drums*. Drum Channel, 2012.

¹⁴ Drum sizes are typically given as diameter x depth, both in inches.

¹⁵ Nicholls, pg. 17.

smaller environments - was an important consideration. This meant that they couldn't overpower the quieter, acoustic instruments. Volume was also a factor in the development of brushes. Before the age of plastic, almost everything was made out of metal - including retractable fly swatters. In efforts to control the volume of the acoustic drum set, these fly swatters became used as quieter alternatives to sticks. A patent was eventually put in place to sell them as 'brushes.'¹⁶

As electronic instruments and amplifiers developed in the 1950s and 60s, a return to slightly bigger drum sizes took place while snares became shallower in depth. Nicholls attributes this trend in snare sizes to Ringo Starr of The Beatles after he was seen playing one on TV. After this point, the development of the drum set has maintained a slower and steadier rate of development; hardware has since become more durable but the sets of the 50s and 60s weren't so different from their modern form.

From this point in history and throughout the development of countless musical styles, the drums and other percussion instruments have provided the rhythmic foundations within popular music. Most importantly, the developments within music have occurred parallel to the technological development of the drums. These includes advancements in hardware and variations of timbres, sonic materials, and techniques. For example, the hi-hat plays an essential role in jazz; the syncopated rhythmic foundation provided by the contraption remains an integral part of the genre to this very day.¹⁷

To understand these technological developments, an understanding of the parts of the drum is needed. There are many factors that determine a drum's sound - the most sonically noticeable being the 'head' of the drum. The drumhead is the membrane, consisting of either

¹⁶ Glass, in *The Century Project*.

¹⁷ Nicholls, pg. 8.

plastic or skin, that is stretched over one or both of the open ends of a drum. Depending on how much contact the head makes with the shell through the bearing edge, the tone of the drum *shell* will resonate.¹⁸ The head is a main determinant of the sound of a drum as it determines the range of overtones, the attack, sustain, range of sensitivity, and the overall sound. Different types of heads are used throughout different types of music, though there are no hard and fast rules as to which one to use. When drummers consider what head should be used, it is more a question of style, sound, look, durability, and utility.

The most commonly used drumhead is the single ply. These heads are typically on the thinner side. The thinner the head, the more overtones and high-end ring - or 'brightness' - will be heard. Single-ply heads are generally quite sensitive, but they're also the least durable of all batter heads. In contrast, double-ply heads consist of two layered plies. In general, double-ply heads have more controlled sound with fewer overtones. They have a more defined attack, a shorter sustain, and a fatter sound than single-ply heads while durability is also increased. Double-ply heads are typically used in heavier, louder musical styles, as they provide a more articulate sound. Both single and double ply heads can be textured with a translucent coating, sprayed solid black or white, or etched to create a textured surface.

In comparison to non-coated heads, drums with textured surfaces have a warmer, slightly more controlled sound with a slight 'sand-paper' texture added to the attack of the drumstick. In addition to coated drumheads, there are many, more specialized designs of drumheads that can be used in recording or for providing enhanced durability. Often these drums include pre-muffled

¹⁸ Bearing edges will be discussed in more detail below.

heads which, as the name suggests, help minimize unwanted overtones by including various materials on the top or underside of the outer edge.¹⁹

One of the more subtle, yet fundamental factors in a drum's sound is the material of the shell. The shell is sounded when the head is struck and affects the drum's resonant qualities. For example, the familiar sound of striking a metal object is heard slightly when playing a metal drum, even though it is struck on its batter head. Likewise, wood drums resonate and provide a timbre that combines with the sound of the heads.

There are seemingly infinite approaches and materials a drum maker can incorporate. Though there are many ways to make them, there are certain more widely-accepted modes of manufacture that are utilized when making shells out of *wood*. "Build-your-own" websites and authors assume a more generalized workshop and list of materials thus they discuss techniques for creating drums with slightly less specialized tools.²⁰ These more common approaches can be summarized within a few terms:

The most widely practiced method:

- Ply

The 'solid shell' methods:

- Stave
- Segmented
- Steam Bent

¹⁹ Azzarto, Fran. "What You Need to Know About... Bearing Edges." *Modern Drummer*, Sept/Oct 2013, <https://www.modrndrummer.com/2014/12/need-know-bearing-edges/#.VStAVZOGPD8>. Accessed 20 May 2017.

²⁰The techniques involved in making drums out of metal escape the scope of this paper for many reasons.

- ‘True’ Solid

And when incorporating additional materials:

- Hybrid

Before making a drum, the drum maker considers what kind of environment the drum is going to be intended for. These considerations can help determine the size (both diameter and depth) of the drum, the heads used, and what kind of durability it should have. Each method of construction has its own sonic and visual distinctions and most companies will usually specialize in one or two methods. But the most common approach to drum making practiced by large scale drum manufacturers and independent project builders involves the “ply” method. This is the case for many reasons, but mainly because it allows a quick turnout of shells and requires only a minimal amount of specialized tools.

The development of ply drums was a tremendous innovation in drum manufacturing, and companies like Gretsch and Ludwig can attribute their success to being early investors in the development of this method.²¹ The enhanced durability and reduced price of ply drum shells helped them gain popularity in the early 30s, and this approach has since become the most common build of drum. When making a ply drum shell, a “female” mold is made which determines a drum’s diameter. Outside pressure from the mold, along with glue and inner pressure helps establish a perfectly round circle. If the plies are cut to the right length, they do not need any pressure being applied from the inside.²² Big drum companies make molds for

²¹ Nicholls, Geoff, pg. 16.

²² Stapleton, Rob. “Building a Ply Drum.” *PDGood’s Drum Manual*, n.d., <https://pdgood.us/drumshed/ply.html>. Accessed 20 May 2017.

drums of various sizes and use them multiple times in order to produce numerous shells relatively quickly. Construction of these drums involves placing thin sheets of wood (or *plies*) inside the mold and applying a layer of glue where additional sheets of plywood can be placed. This added reinforcement from multiple plies of wood helps establish a durability for these drums that is also suitable for large scale production.

It is also common practice to incorporate plies of various thicknesses, lengths and species of wood into a single shell. By incorporating different types of wood into a single shell, it is possible to use a cheaper wood on the inside while a more appealing looking wood can be used on the outside while another harder specie can be placed between the two to increase projection.

²³ It is also possible to use different plies to blend the tonal qualities of different woods into one drum. Furthermore, some drum builders add further durability to their drums by *crossing* the grain direction of the plies. Various members of *Ghostnote*, an online drum building forum, agree that crossing the plies during drum construction is said to make the shell more resistant to going out of round or having a split penetrate all the plies.²⁴

John Good, Vice President of the California drum company Drum Workshop (also known as DW), explains that it is of utmost importance to consider grain orientation when building a drum.²⁵ He argues that one of the main factors in establishing the tone of a drum is its vibration either along or across the grain of a drum. For this reason, some builders will keep the grain direction in mind when making a drum. They will make sure the grain moves vertically

²³ Nicholls, Geoff, pg. 16. Accessed 20 May 2017.

²⁴ DanC. "Re: vertical vs. horizontal grain." *Ghostnote*, 22 July 2009, <http://www.drumforum.org/index.php?/topic/17758-vertical-vs-horizontal-grain/>. Accessed 20 May 2017.

²⁵ Paul, Marty. "The 'Wood Whisperer' of DW Drums." *The Hub*, <http://thehub.musiciansfriend.com/gear-pioneers/a-conversation-with-john-good-the-wood-whisperer-of-dw-drums>. Accessed 19 May 2017.

(through the drum from top to bottom), horizontally (moving along the round of the drum), or in any other combination of directions depending on what sound or “effects” they want from the drum, though there is no evidence of one direction being ‘superior’ to the other in terms of projection or quality. It is also important to note that the sound of a drum does not only resonate straight through the drum like an air column from the point of contact - a drum tone also resonates from the vibration of the shell and heads.

Drum builders began to reevaluate the sonic properties of plywood drums when drummers in the 1980s began to favor the vintage sound qualities provided by stave and solid wood shells. Though multi-ply shells still dominate the market by a huge margin, the community of custom shell builders, who incorporate a variety of the ‘solid shell’ techniques, continues to cater to a more selective customer base. In the 21st century, dedicated custom drum builders continue to challenge the industrialized manufacturing mindset of the larger corporations by creating drums of unmatched quality and craftsmanship through ‘solid shell’ methods.

Jefferson Shallenberger, a local drum maker in Santa Cruz, California, uses solid shell methods in his drum building. On his Sugar Percussion website, he explains:

Solid wood offers the greatest breadth of tone, color, musicality and nuance in drum building and only with stave-built construction can drums be built from any species of solid wood... Stave construction produces a circle at rest... no bent stress, no uneven tension from manipulation of fibers or cell structure... just a perfect circle, calmly awaiting your bludgeoning... Stave construction rules and we’re really good at it.²⁶

²⁶ Shallenberger, Jefferson. “Construction.” *Words*, Sugar Percussion, n.d., sugarpercussion.com/words.

As can be noted above, Shallenberger's approach to drum making incorporates the 'stave' technique, and he believes that the subtleties of a piece of wood's inherent sonic characteristics are nullified by the excessive amounts of glue that are contained in plywood drums. During a visit to his shop, he made a comparison of glue in drums to compressors within a mix - that the voice of a wooden drum can carry a huge dynamic and timbral range but this range can be 'compressed' by layers of glue.

The stave approach to drum making is one of the more common methods practiced among custom drum builders due to the fact that only slightly more specialized tools are required for the job - particularly a router of some sort. A mold is not used in this method. Instead, planks of vertically cut wood are arranged to form a circle. These planks are then glued and bound together. After the glue dries, the drum is shaped, sized, worked, and sanded into a shell. There is less glue used when making a stave drum in comparison to a plywood drum, which many argue helps to provide a better tone. Some consider another aspect of a stave drum's tonal quality to be the vertical grain direction.²⁷

Shallenberger went on to share that the sonic differences throughout the various types of wood, including mahogany, cherry, oak, walnut, and others, are determined by their various degrees of density. He explains that drums shells that consist of denser, more solid, materials are considered to have more sonically "aggressive" traits. They cut through a mix with audacious, distinct qualities, while drums made with softer, more malleable materials consist of warmer, "fatter" sound qualities.

²⁷ dw drums. "Mick Fleetwood's 'The Cherry Picked.'" YouTube, performance by Mick Fleetwood and commentary by John Good, 14 Jun 2013. [youtube.com/watch?v=HsW8uVnYCmQ](https://www.youtube.com/watch?v=HsW8uVnYCmQ)

In many ways, the ‘segmented’ method is similar to the stave approach; the drum shell consists of many smaller pieces of wood that are glued together before being smoothed and polished into a circle. The main difference is that the wood ‘planks’ are arranged with their grain moving *horizontally* along the drum shell, allowing the drum builder to make ring-like segments. The horizontal grain direction is considered to be an additional differentiating factor between the ‘stave’ and ‘segmented’ drum builds as the tones achieved throughout the methods are said to be determined by their grain direction. In a segmented drum, layers of wooden segments, or “rings,” are flattened on top and bottom and layered upon each other until the desired drum *length* is achieved. The drum is then lathed, inside and out, to meet the desired thickness of the shell. Again, there is a significantly lower glue content within these drums in comparison to traditional ply drums, which some believe allows a drum’s natural tone to shine.

It is common for segmented drum builders to incorporate various types of wood into a single segmented drum. In this way, drum builders can embrace the inherent visual aesthetic of this drum build; often, the shells do *not* appear as though they have been simply hollowed from a tree, which is a very common visual aesthetic to establish in wood drums as it obscures the drum making *process*. It is possible to incorporate various wood species in stave drums as well, but the segmented arrangement of various wood species allows a very unique visual aesthetic to be achieved: the visual flow of the drum seems less ‘interrupted’ when the various wood types are arranged in rings. The drum making process is thus highlighted as a means to create visual movement as well as will be discussed in more detail below.

According to Alan Jensen, founder of Addiction Drum Design, the segmented drum shell also retains its tuning longer. On his website, he writes: “Segment shells are more stable and

rigid than any other type of solid shell. A more stable shell means less tuning; the shell stays round, and the head stays seated.²⁸ Jensen explains that as changes in humidity occur, the moisture content in any solid wood will change, causing it to expand and contract. He goes on to explain that the expansion and contraction always happens across the grain, never lengthwise in the board: “Picture a stave shell with grain running vertically – as the wood expands and contracts across the width of the board the overall diameter will change.”²⁹ Drum builders argue that this method can also allow a slightly thinner shell to be made than is possible with the stave method, though it is not the ideal method for making thin shells either.

Among the solid drum build methods, there is also the ‘steam bent’ drum shell approach. Steam bent drums, also commonly referred to as “single-ply drums,”³⁰ are made from a single piece of wood. In order to make a steam bent drum shell, very special tools are required. In addition to a lathe, a special machine that can monitor and control the moisture content of a piece of wood is needed. After the desired moisture content is achieved, the single ply of wood is rolled (bent) along the grain and joined at the ends to form a circle.

In addition to the necessary tools, a very specialized set of skills is essential to the construction of a high quality steam bent shell. An eye for the right piece of wood and the expertise developed only from what can be years of trial and error are also crucial. Because only a single piece of wood is used, hardly any glue is necessary, but there are certain difficulties to bending a single ply for use as a drum; during this process, the drum can snap or crack and requires utmost artistry. Additionally, it is very difficult to keep the shell ‘in round’ and very

²⁸ Jensen, Alan. “About.” *Addiction Drum Design*. Addiction Drum Design, n.d. 2012. Accessed 12 May 2017.

²⁹ Jensen, Alan. “Segments vs. Staves.” *Addiction Drum Design*. Addiction Drum Design, 30 Jun 2012. Accessed 19 May 2017.

³⁰ (Not to be confused with what will be referred to in this essay as ‘true’ solid drums)

often, reinforcement rings are used. But by using only a minimal amount of glue, the drum can resonate freely, which many believe helps provide a more ‘natural’ tone. Furthermore, it is extremely difficult to make a drum with a smaller diameter using this method. For example, the smallest drum that the Craviotto Drum Co. of Freedom, California builds is 10” in diameter while many other drum companies can usually go as small as 6-8”.

While on the subject of quality steam bent drums, it is important to acknowledge the accomplishments of Johnny Craviotto - the founder of the Craviotto company - and his enormous contributions to the drum building community. Craviotto was a master craftsman whose attention to detail and dedication to making high quality instruments gained his drums worldwide notoriety. His vision and ingenuity in drum making gained acknowledgement after he created drums made from old growth wood:³¹ 600-year-old timber that was rescued from the bottom of Lake Superior in 1999.³² Drummers praised these shells for their incredible sensitivity and dynamic range. Since then, his drums have gone on to include engraved hoops and even 24k gold hardware. He even developed his own custom diamond-shaped lug bases and logos, which illustrate his attention to detail within drum making. Craviotto was one of the most well respected drum builders within the drum maker community, and he was a pioneer in drum making as an artform.

Craviotto was also known for his innovations in the construction of the bearing edge of the drum. In essence, the bearing edge is where the drumhead is seated upon the drum. Since this is the area of the shell that has the most direct contact with the drumhead, the shape of the

³¹ Old growth timber is made from trees that grow in dense forests - the decreased amount of sunlight, water and food make for slower growing which results in more rings per inch.

³² Campbell, Bob. “The Life and Times of Master Craftsman, Johnny Craviotto.” *Not So Modern Drummer*. Not So Modern Drummer, 13 May 2015. Accessed 19 May 2017.

bearing edge can affect the sound of a drum quite dramatically. Craviotto's innovation, the "Baseball Bat" bearing edge, is distinctive because it allows more of the shell to make contact with the drumhead. This enhanced contact between the head and the shell allows the drum to resonate with the fewest overtones from the drumhead; the wood itself is the central resonator, making the sound of these types of edges warm and vintage-sounding.

In contrast, drums with "sharper" or thinner bearing edges produce a more defined attack as well as longer sustain; drummers and recording engineers have come to know this lively sound as a "modern" sound. The added attack and sustain are due to less of the drumhead being in contact with the shell, allowing the head to resonate 'uninterrupted.' This design of edge became the standard in the 1980s and is the most common type of bearing edge to this day. Drum makers can even combine different edges on the batter and resonant sides of a drum. Incorporating two different bearing edges on the same shell can help to make a drum set unique to the order of the customer.³³

Finally, there is the "true" solid shell building method. Within this method, there is no joint of any kind, and therefore, no glue is used. Canopus Drums, for example, make this kind of drum from a hollowed out tree trunk. True solid drums are perhaps the oldest method to drum making known to man. Surprisingly, it is also one of the hardest processes to carry out successfully. In order to produce a shell that dries evenly and does not crack, very special tools are used which include lathes, routers, and a kiln - a chamber where the moisture content of

³³ Azzarto, Fran. "What You Need to Know About... Drumheads." *Modern Drummer*, n.d., <https://www.moderndrummer.com/2011/10/what-you-need-to-know-about-drumheads/>. Accessed 18 May 2017.

lumber can be monitored and controlled. A kiln also allows a faster drying process; air-drying lumber can take a very long time.³⁴

There are also drum shells that are constructed from a combination of materials. These drums are known as ‘hybrid’ drums and are admired for their visual properties. Most commonly, this combination consists of wood and acrylic or metal and acrylic, though there is a broad spectrum of materials available. Custom drum makers Matty Longo of Longo Custom Drums and Curt Waltrip of Joyful Noise Drum Company both agree that putting a seam in the shell impedes the shell’s ability to transfer energy. They explain that every material has its own unique tone and that their characteristics should be considered before combining their sonic qualities.³⁵

The drum maker considers many factors when determining what kind of drum they will make: the size, what styles the drummer may play and what environments the drums will be played in. For example, in this age of independent project studios, the drum maker must also assume that the drums are going to be recorded and must therefore provide desirable sonic traits that persist through extended periods of scrutiny. Furthermore, if they are going to be used for live performance or by travelling performers, they must be considerably durable. These factors are considered when choosing either a more delicate single-ply drum or a more durable plywood drum. These considerations lead the drum maker to many questions, but the question of what materials the drum(s) will consist of is one of the biggest factors in what is ultimately created.

A collaboration with an active drum maker seemed to provide the most meaningful sense of how to make drums. This creative portion of my research involved studying the methods of an

³⁴ Loffer, Larry. “Kiln-Dry: What That Means for Wood.” *Wagner Meters*, 21 Dec 2012. Accessed 20 May 2017.

³⁵ Azzarto, Fran. “What You Need to Know About... Drum Shells.” *Modern Drummer*, Sept/Oct 2011, <https://www.moderndrummer.com/2015/02/need-know-drum-shells/>. Accessed 18 May 2017.

independent drum maker in Ventura, California. Andrew Jones, the founder and sole creative force behind the company Thump Drums, started to make drums in the early 2000s and has made drums for artists including Zach Hill, Eric Moore II, Thomas Pridgen, Anderson.Paak and many others. After seeing his drums and art and learning the story of his company, I decided to ask him to do an interview in hopes of including some of the information within a paper. Upon hearing what my project would consist of, he offered to help me make a drum for myself and incorporate what I learn into my project.

Jones has an incredible passion for individuality, art and drum making, and I was honored to have been given the opportunity to work with such a tremendous creative force. We planned to make a drum around the end of 2015 and though my initial motivation to make a drum was to develop an understanding of the drums, building an instrument that I was truly connected to quickly became the driving inspiration behind the project. I wanted to build a drum completely from scratch and be there for every step of the process - from making the shell to assisting Jones in fitting the hardware. The initial concept behind the first drum - a bass drum - was to create something with a smaller diameter while also experimenting in depth sizes. Furthermore, the drum would consist of odd colors, and there wouldn't be another drum like it. With Jones' help, this would be a simple task; every drum that he makes is one of a kind.

Thump Drums exemplifies drum building as an artform and illuminates how the construction process can highlight certain artistic or creative choices. Jones' drums provide a very visual aesthetic in addition to their timbral qualities. His unique approach to blending colors, resin, and epoxy provide for very artistic looking drums. Often, his drums incorporate a

blend of vibrant colors and lights and look very much like paintings. The drums we made, a bass drum and a snare drum, were no exception.

The first drum we made was an 18” bass drum which was actually constructed from two different shells we had bolted together. We intentionally left a space between the two shells as an experiment in timbre. Air escapes from open drums and this space between the shells allows some of that openness to remain even while a resonant head is attached to the drum. We chose to make an 18x16 drums because I have always been drawn to small diameter bass drums - it is much less common to see them in that size. As discussed earlier, the standard size of a bass drum is 22” with smaller ones being around 20” in diameter.

The second drum we made was a 14”x8” snare drum. The qualities that we wanted this drum to achieve were similar to the “older” snare models. Though the shell - being very thin - lends itself more easily to a modern, brighter sound, I wanted to make a darker, vintage sounding drum. In order to achieve this, I incorporated 8 lugs onto the drum. Lugs are the large metal brackets where the tension rods are screwed in. They keep the drumhead seated to the shell; having more of them allows the drummer to apply greater tension across the hoop and head. In contrast, having less of them imparts a distinct, more “open” tone. The amount of lugs on a drum typically ranges from 4-10, with some having as many as 12.

Incorporating 8 lugs allowed us to achieve this warmer, more laid back tone. Also, the lugs are what are known as *tube* lugs. This type of lug is another contributor to the vintage look and feel of the drum since this type has been replaced in most modern drum constructions by the *die-cast* lug after its development. This decision was more a factor of visual association with

older drums than it was a sonic decision, though the long tube length helps to allow the shell to resonate freely. Finally, thicker heads were incorporated to achieve a more focused sound.

I wanted to make a snare and bass drum because they are the cornerstone of the modern drumset. They sit in the middle of the drum kit and have provided the rhythmic foundation for music throughout numerous cultures. The snare drum in particular is helpful in analysing the sound quality of a drum shell for many reasons, but particularly because of the snares located on the resonant head of the drum. The white noise provided by these snares allows an analysis of a shell's sonic properties; the drum's interaction with frequencies throughout the entire sound spectrum reveals the characteristics of the drum. Making a snare allowed for a perfect analysis of drum building while also allowing me to synthesize what I have learned about drums.

Each drum has a special place in the drumset but when it comes to defining a certain aesthetic, the sound of the bass and snare drums play an important role. In the modern drum kit, there are the rack toms and floor toms and perhaps additional bass drums but when analyzing the styles of music throughout the history, we can see a direct correlation between styles and the types of drum sounds that are utilized. The cymbals are incredibly important to the central concept of the drum set as well and can also be considered the "other half" of the drum set sound.

In the present day, it is evident that drummers have begun to experiment with an electronically synthesized sound palette. The electronic drum kits that have resulted from the incorporation of electronic sounds are also in constant development. Hybrid acoustic and electronic kits are very recent developments but have also seen very dramatic improvements in responsiveness and sensitivity. Furthermore, drummers now incorporate sounds *inspired by*

those within the digital domain; they explore recreating the sounds of the computer through the integration of more “compressed,” or consistent, acoustic sounds as well. This is in reaction to samples, loops and drum machines. These electronic sounds also lend themselves to the kind of effects processing and rhythms present in electronic styles. It is important to note that the electronic and acoustic drums are two (almost) completely different instruments. Though electronic drums and other electronics have taken a dominant place in contemporary music, the drum set will continue to hold a special place in the future of art and music.

The drums will continue to develop while retaining their simplicity. Though many music critics argue that the virtuosity and abilities of drummers have surpassed what is required to play popular music, there are plenty of techniques, sounds, and styles left for drummers to develop. Seeing the connections between technology and music through the scope of the drums has been incredibly inspirational. No one knows what the future holds in regards to the developments of drum technology but greater unification between acoustic and electronic kits will take place.

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