

# The High Altitude Clarinetist

by Stephanie Zelnick

Any clarinet aficionado knows that true study of the instrument can be almost fanatical in nature. Entire online forums are devoted to detailed subjects such as gear, compositions, performance style, and technical minutia. It is therefore surprising that more attention is not dedicated to physiology as it pertains to the performer in a variety of environments.

While many concerts and auditions take place at higher elevations, there is a dearth of materials on playing the clarinet above 5,000 feet. This article seeks to remedy this lack of information by providing a brief guide to performing outside of the typical comfort zone of most wind instrumentalists. Beyond the implications of playing at higher elevations, this material can help with aspects of mastering the clarinet in all locations. The article also raises the possibility of training for auditions and performances at high altitudes, much like the finest contemporary Olympic and professional athletes.

In order to ascertain the most effective techniques for performing at high altitudes, the author surveyed clarinetists who had secured employment at elevations close to or above 5,000 feet. The participants were: Bil Jackson, former principal clarinet of the Colorado Symphony (5,280') and clarinet faculty of the Aspen Music Festival (7,890'); Lauren Jacobson, clarinet faculty at University of Northern Colorado (4,658'); Ted Lane, principal clarinet of the Orquesta Sinfónica Nacional del Ecuador (9,350'); Blake McGee, clarinet faculty at the University of Wyoming (7,165'); Joshua Mietz, clarinet faculty at Casper College (5,150) and ultra-marathoner; Michelle Orman, principal clarinet of the Colorado Ballet (5,280'); Jason Shafer, principal clarinet of the Colorado Symphony (5,280'); James Shields, principal clarinet of the New Mexico Philharmonic

(5,100'); Dan Silver, clarinet faculty at the University of Colorado, Boulder (5,430); and Erin Svoboda, former assistant/E-flat clarinet of the Colorado Symphony (5,280').

So how do clarinetists make the requisite adjustments to perform in such conditions? Using the advice of these high-altitude clarinet experts and compiling data from medical and athletic professionals, we can explore three important categories: general physical conditioning, specific clarinet considerations/exercises, and adjustments to gear/reeds.

## PHYSIOLOGICAL EFFECTS

There are major environmental and physiological differences between sea level and elevations over 5,000 feet. Thomas Dietz explains the physical mechanisms of high altitude adjustment:

As one ascends through the atmosphere, barometric pressure decreases (though the air still contains 21% oxygen) and thus every breath contains fewer and fewer molecules of oxygen. One must work harder to obtain oxygen, by breathing faster and deeper. Dramatic changes take place in the body's chemistry and fluid balance during acclimatization. The osmotic center, which detects the "concentration" of the blood, gets reset so that the blood is more concentrated. This results in an altitude diuresis as the kidneys excrete more fluid. The reason for this reset is not understood, though it has the effect of increasing the hematocrit (concentration of red blood cells) and perhaps improving the blood's oxygen-carrying ability somewhat; it also counteracts the tendency for edema formation.



Aspen, CO (7890')

The practical implications of these dramatic changes are quite significant for the human body and in severe cases can lead to AMS (Acute Mountain Sickness), HAPE (High Altitude Pulmonary Edema) and HACE (High Altitude Cerebral Edema). Fortunately all of these conditions can be remedied by immediate descent and do not occur frequently at the altitude of most concert settings.

The change in the body's basic metabolic functions at higher elevations has a significant impact on all people, but can be especially problematic in the areas of athletic and musical performance, when humans are already working their bodies to full capacity.

Although in most cases the organism will eventually adjust to moderately high altitudes, there is a marked and dramatic difference in breath support, concentration levels, and physical dexterity above 5,000 feet. The upside of having to adjust to this environment is that the body retains a higher level of red blood cells, and therefore a better ability

to use oxygen, for a short period after descent to lower altitudes. This presents profound and definite advantages for performances within a two-week window of acclimatization. Just as athletes choose

to train at higher elevations for optimal results (the Olympic training center in Colorado Springs, elite runners in Boulder, Colorado), clarinetists might also choose to use the mountains as training camps for sea-level auditions and performances.

### PHYSICAL CONDITIONING

All of the musicians polled agreed that higher elevations adversely affected their breath support, phrasing, and tone quality. They also mentioned issues with concentration, energy, and stamina. The good news from all the participants was that these obstacles could be overcome with proper conditioning and acclimatization. Time was a major factor and most clarinetists said that they felt dramatically better after a few days to a few weeks. Most mentioned the importance of arriving early and acclimating gradually if possible. Hydration, sleep, and proper nutrition were important factors, as well as good physical conditioning *before and during* time above 5,000 feet. Joshua Mietz, clarinetist and ultra-marathoner at

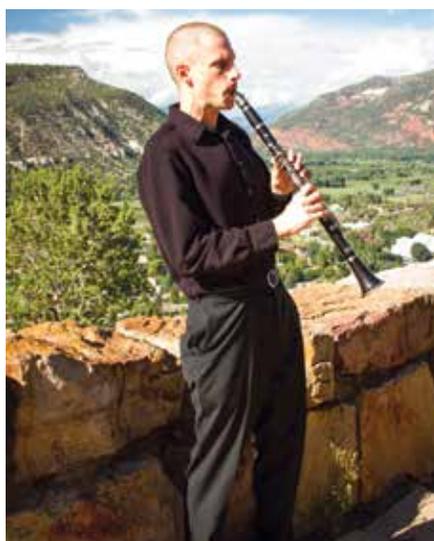
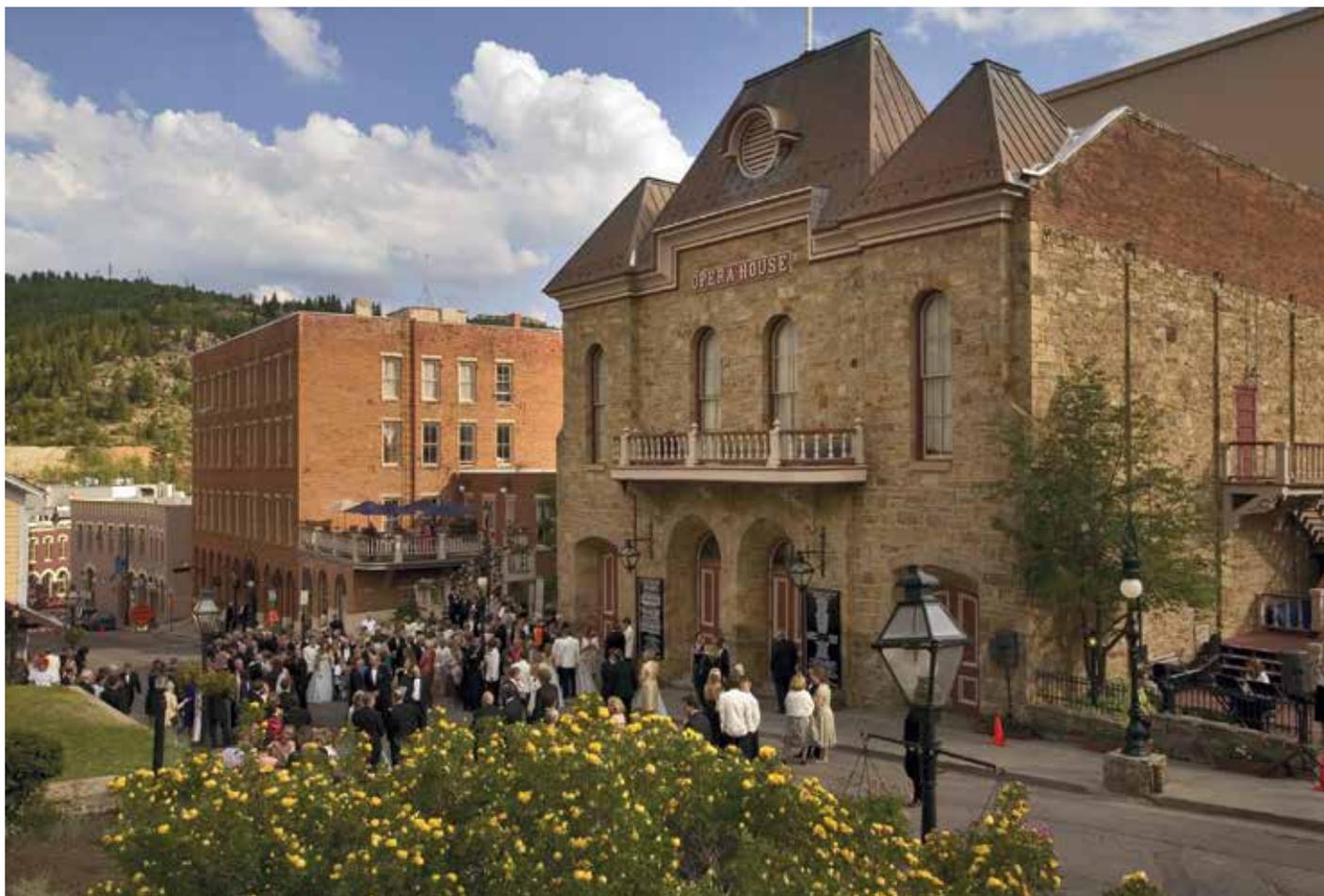


Photo Credit: Harri Baumbach

Joshua Mietz performing at Lion's Den Amphitheater in Durango, CO (6900')



Central City Opera House (8510')

high altitudes, mentions an interesting possibility of a nutritional “blood doping” method to increase iron intake through eating foods such as leafy greens and red meat. Other participants cite the usefulness of consuming electrolytes or blood thinners.

Having trained with an Olympic running coach and world-class athletes, Mietz has specific acclimatization routines that help mitigate the adjustment:

Everything I’ve learned indicates that there is a window for altitude acclimatization. People like Steve Prefontaine and Frank Shorter would spend their off-seasons training in the hills west of Boulder, now a mecca for endurance athletes. In the first 48 hours, most people don’t notice any difference. After 48 hours and before 10-14 days, people are most susceptible to altitude sickness. My personal preference upon arriving at altitude

is to complete a workout that I would deem “very hard” at an elevation higher than where I’ll be staying or playing. Everyone’s fitness is different but I like to go and do a series of an hour’s worth of 1-minute hill repeats within 24 hours of arriving. That means run 1:00 up hard, run down for 1:00, and start again. I feel this stresses my system out enough that it forces acclimatization. It seems silly to think of improving your clarinet playing by doing hill repeats but I typically have no symptoms of acclimatization or altitude sickness after doing this.

### **SPECIFIC CLARINET EXERCISES**

Like most professional clarinetists, the participants had daily warm-up routines that became even more specific at higher elevations. In addition to any number of long tone routines, a useful exercise is to

incrementally increase the duration of exhalations. For example, the clarinetist can play single-octave scales at quarter = 120 and hold each note for four counts. Wait for eight beats at the top and then descend the same way. Before the next scale, lower the tempo to 116, then 112, 108, etc. on subsequent scales until the player can execute a scale in this manner in whole notes at quarter = 60. At higher elevations this is quite a feat. The key to this exercise is allowing the lungs and diaphragm to gradually adjust to long tones at higher elevations. Above all, relaxation is crucial, as the body is already struggling with the mechanisms of proper breath control.

Another exercise is to gradually extend the last notes of longer passages during practice sessions. The clarinetist can also play a difficult long phrase progressively slower than the actual tempo with the possibly unattainable goal of practicing the passage at half the notated speed. While

these may seem like impossible exercises when first arriving at higher elevations, they gradually trick the mind and body into a feeling of ease and comfort at slower moments in the music. This is crucial before auditions or concerts at higher altitude, where the lack of proper support can lead to an almost panicked feeling while performing. A warm-up routine that incorporates long tones is essential, especially one that becomes progressively longer in duration. Doing this before an audition or performance at elevation can make a tremendous difference in success rates.

Since the clarinetist will possibly have to breathe more often at higher elevations, it is best to prepare for this ahead of time. Dan Silver at the University of Colorado has a wonderful tip in this regard:

If one's breath is compromised, then it makes sense that learning to breathe in a way that connects the musical sounds rather than interrupts would be an ideal to pursue. This would be true at any altitude, of course, but is critical when one is required to breathe more often. I like to use good flute players as models in this regard: they breathe 2-4 times more frequently than clarinet players, and yet no clarinet player complains about how often the flute players have to breathe! They become adept at holding and shaping ends of notes in ways that allow the breath that follows to seem perfectly natural and they also learn to take quicker breaths as a rule than clarinet players.

Several of the clarinetists polled also mentioned the importance of conserving energy while performing. Lauren Jacobson emphasizes this point:

Make sure your body movement is no more than necessary. Large movements or repetitive motion can cause fatigue and therefore breathing issues, especially when combined with the nerves of performing. Efficient, musical body movement is ideal. Non-musical or repetitive habits are a waste of valuable energy!

In addition to these suggestions, there are countless others that can be

incorporated into successful performing at higher altitudes. The key is to establish excellent warm-up hygiene at lower elevations and to simply expand upon these principles for optimal performance in all environments and conditions.

### GEAR/REEDS

Reeds uniformly feel harder at higher elevations than at sea level. Most of the clarinetists polled went down a reed size or did extensive adjustments above 5,000 feet. Since warping of reeds is such an issue in dry climates and the clarinetist has less air support to counteract any inconsistencies, it is necessary to make modifications using tools such as knives, sandpaper or files. Proper humidification systems are key, whether choosing Reed Vitalizers, Hygrocases, or any number of other options. One quick and simple trick is to place the reeds in a Ziploc bag with a damp sponge.

Bil Jackson suggests keeping a moist sponge in the top of the mouthpiece cap at all times and to instantly put it over the

mouthpiece when not actively playing. This way, when the reed leaves the environment of the mouth it remains stable in an almost equally humid environment.

Because of the lack of adequate air support at higher elevations, it is harder to overcome deficiencies in reeds and equipment. Therefore it is imperative to break reeds in gradually so that the xylem and phloem are stable when they swell and contract. A well-adjusted reed will have minimal fluctuations, which is imperative to consistent quality in regards to response and tone. Above all, the clarinetist must come equipped with a plethora of options such as different reed strengths, mouthpieces with various resistances, and a willingness to experiment with reed adjustment techniques to best suit their individual needs and challenges. Altitude only serves to exaggerate a player's weaknesses in this regard.

The clarinetist must not be afraid of experimentation with equipment at higher elevations. Often what works at lower altitudes is simply too resistant or non-

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resonant in the mountains. James Shields is a fan of trying new equipment in this environment:

Making adjustments to reed strength helps a lot, but even after making attempts to equalize resistance and blowing characteristics, I find that the ease of producing and/or suppressing certain ranges of overtones in the sound is just different at higher altitudes. I experiment with different ligatures and barrels to further refine sounds and blowing characteristics, something that is often a necessity for different acoustics, ensemble sizes, and styles.

In high, dry, and cool climates, clarinets have extreme problems with wood

shifting and even cracking. Several of the clarinetists interviewed had special heated and humidified cases, while others merely put orange peels in with their horns.

*Every single musician interviewed made it a priority to create a stable and consistent environment for their reeds and clarinets.*

Performing at higher elevations presents certain challenges for the clarinetist, but the benefits can be worth the effort. By overcoming these difficulties, the musician can perfect good practice and health habits that are beneficial in all environments. ❖

#### BIBLIOGRAPHY

Cox, Stephen M., Kris Fulsaas, and The Mountaineers (Society). *Mountaineering the Freedom of the Hills*. Seattle: Mountaineers Books, 2003.

Dietz, Thomas E. "An Altitude Tutorial." *International Society for Mountain Medicine*, Nap. 6, June 2011.

Levine, Benjamin D., and James Stray-Gundersen. "Living high – training low: Effect of moderate-altitude acclimatization with low-altitude training on performance." *Journal of Applied Physiology*, v. 83, n. 1, p. 102–12, 1997.

Pollard, Andrew J. and David R. Murdoch. *The High Altitude Medicine Handbook*. London: Radcliffe Medical Press, 2003.

Ward, Michael, James S. Milledge, and John B. West. *High Altitude Medicine and Physiology*, 3<sup>rd</sup> edition. London: Hodder Arnold Publications, 2000.

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