

In the Refuge of a Cave

for solo performer and live processing
(version for bowed instrument)



Pictured: Ape Cave, near Mount St. Helens, WA. Jeffhollett / CC BY-SA (<https://creativecommons.org/licenses/by-sa/4.0>)

Nicholas Denton Protsack



Original Score.

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Program Notes:

Before there were bunkers, fortresses, or strongholds, there were caves. Since long before the dawn of recorded history, caves have held a universal significance as a source of refuge—a safe haven from the elements, predators, and natural disasters. Inversely, however, caves have widely been known to inspire a sense of apprehension and foreboding as well—potentially harbouring in the darkness the very dangers from which they are meant to offer protection.

Writing these program notes in late July of 2020, I can't help but compare the duality of caves to the tremendous changes that have taken place during the last six months. The Pandemic has forced just about everyone to reinvent their lives in order to preserve their safety and security. Whether metaphorically or analogously, we have all retreated to our caves in one way or another. For example, while many of us have achieved refuge through social distancing and sheltering-in-place, doing so has forced us to face the existential darkness of isolation and confinement.

In the Refuge of a Cave (2020) is my perspective on these themes as a composer and musician. What musical artists could once rely upon—concert spaces, audiences, even the ability to perform onstage together—has disappeared or drastically transformed in mere days. Now, one's own insights, abilities, and resources are the only certainties in their musical endeavors. When writing *In the Refuge of a Cave*, I imagined these restrictions as a literal cave surrounding the musical artist. What could a musician do to create music if they were isolated within a cave? How could one find artistic fulfillment in such a lonely and remote place? The only natural answer is that a musician would need to make do with the sonic resources and tools that the space granted them. The musician would utilize the reverberations and echoes generated by the cave's walls; in doing so, they would stumble upon a way to play music with another—a past version of themselves—an echo.

In the Refuge of a Cave is dedicated to my many friends and colleagues who have found themselves forced to navigate a unique cave of their own in these challenging times. Thus, it is designed to be playable by any instrument or voice type, and no two performances will ever sound alike.

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Required Hardware/Software:

- Laptop or computer capable of running at least Ableton Live 10.
- Stereo speakers or monitors (more than two speakers can be used if desired).
- High-quality microphone or USB microphone.
- Audio interface (not required if USB microphone is used).
- Ableton Live 10 Suite (or any version capable of running Max for Live 8 or higher).
- "In the Refuge of a Cave.amxd" Max for Live patcher available at www.dentonprotsack.com.

Setup:

1. Download the patcher (and score) from www.dentonprotsack.com.
2. If not already installed, install Ableton Live 10 Suite (or another version capable of running Max for Live 8) (a free trial is available at www.ableton.com).
3. Move the patcher to the "Max Audio Effect" folder, found under "Ableton">"User Library">"Presets">"Audio Effects".
4. Connect the desired microphone or audio interface to the computer. Connect the desired monitor or

speaker system to the computer or audio interface. Ensure that the computer recognizes both external devices.

5. Create a new project in Ableton Live.

6. Create an "Audio" track, and set the "Audio From" to match the input of the desired microphone. Go to the "Master" track and set the "Master Out" to match the desired monitor or speaker system.

7. Ensure that the "Audio" track is selected and drag "In the Refuge of a Cave.amxd" patcher found under "Max for Live">"Max Audio Effect" into the "Drop Audio Effects Here" field.

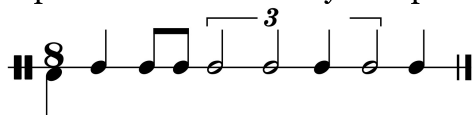
8. If desired, drag a light reverb effect to the RIGHT of the patcher in a similar manner to the previous step.

9. Set the "Monitor" value to "In".

Notes for the Performer:

In the Refuge of a Cave is a work for a solo performer and live digital processing via a customized Max for Live patcher. The patcher works in tandem with a form of aleatoric notation, both of which are explained in detail below:

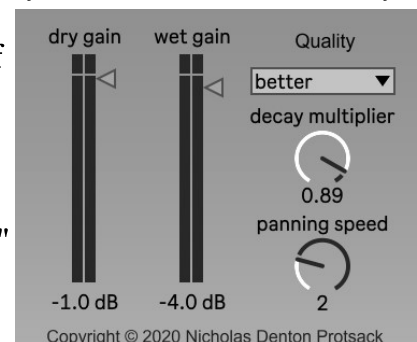
The patcher consists of an echo effect with original modifications that alter duration and pitch. Instead of repeating a given sound at regular intervals as a normal echo would, the patcher used in *In the Refuge of a Cave* creates a series of echoes, each with a unique duration and tuning modification applied to the original sound. The series repeats itself when completed, forming a regular cycle of pitch and rhythm that the performer can directly respond to; in fact, the piece is designed so that one repetition of the echo cycle equals one bar of music. The rhythm of the cycle is as follows:



The tuning modifications featured in the cycle are difficult to express with standard notation because they lie outside the tuning of 12 equal temperament. Instead, they have been expressed below in justly intoned ratios, in addition to cent values (in brackets):

3/4 (-498¢), **5/4** (+386¢), **11/8** (+551¢), **1/1** (+0¢), **7/8** (-231¢), **9/8** (204¢), **13/16** (-359¢), **17/16** (+105¢).

The patcher also has several fluid parameters that can be manipulated by the user as desired. "Dry Gain" controls the volume of the initial sound that enters the patcher (the default value is set to -1.0 dB). "Wet Gain" controls the volume of the sounds the patcher produces (the default value is set to -4.0 dB). "Quality" controls the fidelity of the sounds the patcher produces; a lower fidelity may reduce CPU load on slower computers. "Decay Multiplier" controls the rate at which the echo chain decays (the default value is 0.89—or 11% decay per echo). Lastly, "Panning Speed" controls the rate at which the echoes move spatially around the stereo channels. The values range from 1-5. A lower value causes the echoes to remain almost stationary, and a higher value causes the echoes to rapidly shift location (the default value is set to "2").



In the Refuge of a Cave uses a form of aleatoric notation, in which pitch and phrase structure are left up to the performer's discretion. A single line staff is used instead of the standard five lines, with notes written on and around the line. Thus, exact pitch is impossible to infer; instead, the performer must choose pitches at their own liberty while ensuring that they follow the basic contour of the music. Only

one pitch must remain consistent: the pitch that lies directly on the line of the staff. The performer must determine this pitch at the start of their performance, and base all their gestures around said pitch.

Phrase structure in *In the Refuge of a Cave* is given a similar aleatoric treatment. For starters, each bar of music is assigned a range of possible repetitions (denoted in a box to the right of the bar). The performer may opt to play the bar any number of times within the given range. Once the performer is finished playing a given bar, they must proceed *attacca* to an adjacent bar as indicated by the arrows (→) marked in the score. The performer may only proceed to a bar that is connected to their current bar by an arrow, and the direction of the arrow must be observed (no back-tracking is allowed). If a bar has multiple arrows leading away from it, the performer can choose a given path at their discretion.

Lastly, the form of the work is divided into 4 sections and a coda. The order in which these sections are played is also determined by the performer. This is achieved through boxed directions included in each section. The performer reaches the end of a section when they follow a marked arrow that leads to one of these boxes. Inside each box, there are directions that instruct the performer to proceed to one of two possible sections (for example, "Section 1" can lead to either "Section 2" or "Section 4"). While this choice is also up to the performer's discretion, every section must be explored before the performance can be concluded. When proceeding to a new section, the performer must begin at the bar with "START" or "ALTERNATE START", marked above it. Finally, the performance ends when the performer proceeds to the "Coda" section and finishes playing all the material written within.

Instructions for Bowed Instrument Version:

General Instructions:

- The pitch that lies directly on the single line of the staff must be an open string.
- All diamond noteheads should be played as harmonics. The fundamental of a given harmonic is at the discretion of the performer except for cases in which a fundamental notehead has been included below the harmonic. These either imply an artificial harmonic or a natural harmonic depending on whether the notehead is bracketed or not (bracketed = natural harmonic, standard = artificial harmonic).
- Choices of pitch that lie outside the standard intonation of 12-ET are encouraged, and entirely up to the performer's discretion.
- Notes indicated with a '+' sign above them are intended to be played as a left hand pizz.

Techniques:

ricochet, unpitched - The performer should let the bow bounce rapidly on the string—as used in a standard *ricochet* stroke—but dampen the strings with the left hand so that an unpitched percussive sound somewhat reminiscent of a snare drum role is produced. Altering the placement of the left hand causes the timbre of the sound to change, but never should pitch be blatantly produced. This technique is notated using an 'x' notehead with tremolo lines on the stem.

vertical bowing - Instead of bowing perpendicular with the string, the performer should very lightly bow parallel with the string in a sweeping vertical motion. This produces a wispy, unpitched sound with a breathlike quality to it. Much like *ricochet, unpitched*, the placement of the left hand only alters the timbre of the sound—blatant pitch should not be produced. This technique is notated using an arrow-shaped notehead. When the arrow is pointing up, the bow should travel away from the bridge; a downward arrow indicates a stroke in the opposite direction—towards the bridge.

In the Refuge of a Cave

for solo performer and live processing

Nicholas Denton Protsack
(c. May - July 2020)

Version for bowed instrument

SECTION I:
suggested duration: 45" - 1'30"

START
Moderately (one echo cycle/bar) ($\text{♩} = 83$)
ricochet, unpitched
(mute strings with hand)

play 1-4x *mp* (ricochet) *mp* (vertical bowing) *p* (vertical bowing) *pp* *p*

play 1x (vertical bowing) *p* *mp* 6"-9" (vertical bowing) *mp* *pp*

play 1x *pp* precipitando *f* *sfz sfz*

Go to **SECTION II** or **SECTION IV**

SECTION II:
suggested duration: 1'15" - 2'30"

START

play 1-3x *sfz* (harmonic) *arco* *mp* Go to **SECTION III** or **CODA**

play 1x *mp* *f* *pizz.* *f* *p*

play 2-3x *p* (alternate strings) *pp sempre*

play 1-3x *pp* *sempre*

play 2-3x *mf < sfz* *mf < sfz* *mf < sfz*

Original Score.

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SECTION III:
suggested duration: 1'00" - 2'00"

START

arco

play 1x *ppp*

arco

play 1-2x *mp* *p* *mf* *n*

pizz. arco

play 2-3x *p* *f* **3"-5"**

play 3-5x *mp* *mp* *p < mf >* *p < f >* *p < mf >* *f* *p*

morendo

play 1x *p* *mp* *pp* *p* *n*

Go to **SECTION IV** or **SECTION I**

SECTION IV:
suggested duration: 1'15" - 2'30"

START

arco

play 2-4x *n* *mf* *n*

ALTERNATE START

arco

play 2-4x *n* *mf* *n*

ord.

play 1x *n* *f*

Go to **SECTION II** or **CODA**

play 1x *mp* *n* *n* *f*

play 1-3x *pp* *f* *pp*

CODA:

START

pizz.

play 2-3x *sfz* *sempre*

play 1x *pizz.* *p* *strum* (mute strings with hand) *let echoes fade out*