AFFIDAVIT OF TRINI REDBIRD

Hello! My name is Trini Redbird. I'm 44 years old, and I'm from Cascade County, Oregon. I've got what I consider to be the coolest job in the entire world: I'm a medical doctor and scientist specializing in audiology. I earned my bachelor's degree in physics from the Oregon State University. After that, I attended Stanford Medical School, which I earned an MD and a PhD in audiology and hearing sciences. After I completed graduate school, I accepted a position on the faculty at the Rowe College of Health & Medical Sciences, where I've been a professor and researcher ever since. I regularly publish scholarly work in audiology-related medical journals, and I routinely speak at well-known medical conferences on similar topics. I've also testified as an expert in about a half-dozen civil trials over the course of my career, in each case as an expert witness for the defense in cases alleging medical malpractice. I've never testified in a civil rights case, but I'm looking forward to doing so. Who knows, maybe it'll lead to more opportunities for me to testify in other similar cases?

As a branch of medicine and science, audiology is about much more than just making sure folks can hear the TV from across the room. It's an incredibly rich field that focuses broadly on hearing, balance, and a range of related disorders. It's as much about physics (*i.e.*, what happens to sound when it's entering the human ear) as it is about psychology and neuroscience (*i.e.*, what happens to sound after it's entered the ear). Especially given the latter features of the discipline, it's an inherently inexact science. That, however, is part of what makes the field so exciting: practically every day, it seems, we're discovering new and exciting things about how humans capture and process the sounds around them.

Jersey Jackson's lawyers asked me to provide expert testimony in support of Jersey's claims against Officer Marlowe Navarro, which I'm glad to do; from what I've read about this case in the news, it sounds like Jersey was pretty badly mistreated. Jersey's lawyers asked me to evaluate whether an average human being in Officer Navarro's physical position would be able to hear the statement that Danger Smith made just before Jersey's arrest about entering the Digby Theater. I based my analysis the description given by Officer Navarro in Officer Navarro's affidavit of Officer Navarro's position relative to various other individuals and objects at the protest that occurred at the Digby on January 15, 2020, as well as the other statements in that affidavit and the additional observations outlined further below. The principles and methods that I applied are reliable and well-accepted in the field of audiology, and I applied each of them reliably in this case.

In a case like this, the best place to start is with the sources of the relevant sounds themselves. Here, Officer Navarro has testified that Officer Navarro was standing 50 feet away from a couple of bulldozers when Officer Navarro supposedly heard Danger's comment. The two most relevant sounds,

then, are the sound of the bulldozers — which almost certainly would've been the loudest noise around Officer Navarro at that time — and the sound of Danger's comment itself. I wasn't able to locate any recordings of that moment in the protest that were relevant and sufficiently reliable, but, fortunately, each type of sounds has a fairly consistent decibel level. (A decibel, by the way, is the standard unit we use to measure a sound's loudness.) If you're standing, say, six feet away from a bulldozer, the sound of its engine will range from 100 to 120 decibels. For purposes of my analysis, then, I assumed a decibel level for the bulldozer of 110. Danger's voice is a little harder to pinpoint, but, in general, the sound of a human yell will range from 70 to 90 decibels. (Again, that's assuming you're about six feet away.) For purposes of my analysis, I assumed a decibel level for Danger's yell of 80 decibels. Those estimates are well-grounded in the relevant scientific literature, which is actually quite voluminous; audiologists have been measuring the intensity of those sorts of common sounds for quite literally decades.

That's just the starting point, though. When it comes to sound, distance is key, because the volume of a sound decreases the farther away you get from it. In normal circumstances, a sound's intensity will decrease by about six decibels every time you double the distance from its source. That principle (which is based on a well-established principle of physics called the "inverse square law") allows us to approximate the relative intensities of the sounds of the bulldozers and Danger's comment from Officer Navarro's perspective. Officer Navarro, we know, was about 50 feet away from the bulldozer. If at six feet the bulldozer's sound was 110 decibels, at 12 feet it'd have been approximately 104 decibels; at 24 feet, approximately 98 decibels; and at 48 feet, approximately 92 decibels. Officer Navarro also testified that Officer Navarro was about 100 feet away from Danger at the time Officer Navarro heard the comment. By comparison, then, if the sound of Danger's yell at six feet was 80 decibels, at 12 feet it'd have been approximately 74 decibels; at 24 feet, approximately 68 decibels; at 48 feet, approximately 62 decibels; and at 96 feet, approximately 56 decibels.

One key thing to know about the decibel system is that it's logarithmic. In other words, the difference between sounds of 30 and 40 decibels is *not* the same as the difference between sounds of 40 and 50 decibels; in real terms, the latter difference is much greater. That in mind, it's important for me to put the numbers I've just given you in context. The quietest sound that the human ear is able to detect is usually somewhere around 20 decibels. (Think of autumn leaves rustling in the wind…) The loudest sound that a human brain is meaningfully able to process is somewhere around 120 or 130 decibels, at which point you're risking permanent damage to your hearing. (Imagine you're standing on a runway while a jet takes off…) What's in between? Well, a whisper is usually about 30 or 40 decibels, and most people's normal speaking voices are somewhere in the neighborhood of 50 or 60 decibels. At around 80 decibels,

you get to about the level of a bustling city street, a busy playground, or perhaps even something like a subway station at rush hour. At 100 or 110 decibels, you're at about the level of a jackhammer.

Of course, it bears emphasizing that all of those examples are approximations. It's equally important to note that the specific circumstances in which a sound occurs can have a major impact on how easy it is to hear. If you're driving in a car or meeting a client in a small conference room, for example, the sound of your conversation will reflect and carry in a way that doesn't occur in more open areas. Even if you're not inside, your surroundings can have a similar impact, depending on the degree to which they reflect or dampen sound.

Still, because none of those circumstances were present here, I'm able to come to a reliable conclusion about how easy it would've been for an average human being in Officer Navarro's position to hear Danger's comment. As I suggested above, from where Officer Navarro was standing, the sound of the bulldozer would've been louder than a busy subway station but not quite as loud as a jackhammer. At the same time, the sound of Danger's comment would've been about as loud as someone talking in a normal speaking voice. It's also noteworthy that Officer Navarro testified that a number of other people (mostly protesters, it seems) were yelling and shouting in the same general area. It's difficult to say exactly how that would've impacted Officer Navarro's hearing — to do that, I would have needed to conduct an analysis on-site, which I wasn't able to do — but it's safe to say that it wouldn't have made Danger's comment any clearer. All that in mind, it's my expert opinion that, given the circumstances that Officer Navarro describes in Officer Navarro's affidavit, it would've been very difficult for Officer Navarro to have heard Danger's comment. After all, if you're walking down the sidewalk with a friend and pass by a jackhammer, what's the likelihood that you'll still be able to make out what your friend is saying? As we all probably know from experience, not much.

Now, can I say with certainty whether Officer Navarro *actually* heard the comment? No, and it's possible that Officer Navarro did. I'm not a mind reader, and every person's hearing works a little differently. In particular, it's important to remember that the human ear generally is better at picking up higher frequencies than lower frequencies. "Frequency" refers to a sound's pitch, *e.g.*, whether it's high-pitched (like a whistle), low-pitched (like the sound of a bass guitar), or somewhere in between. The pitch of a human voice can vary quite a bit, but it's basically always going to be higher than a bulldozer's engine. But, a difference in pitch alone definitely won't guarantee that the human ear will pick up on a particular sound.

Additionally, I can't speak at all to the issue of Officer Navarro's comprehension of Danger's statement. It's one thing for a person to hear a series of spoken words; it's quite another for the person to understand them. It's theoretically possible that Officer Navarro heard Danger's comment in the sense

that the comment's soundwaves reached Officer Navarro's ear, but that Officer Navarro misheard them as something else. Have you ever listened to a song, looked up the lyrics, and realized that you completely misunderstood what the singer was saying? That's the sort of thing I'm talking about. I can't speak to that issue here because I didn't seek to interview Officer Navarro prior to providing this affidavit; in order to evaluate comprehension, I'd need at minimum to conduct an in-person interview with the subject. (In retrospect, perhaps I should've done that.)

I hereby attest to having read the above statement and swear or affirm it to be my own. I also swear or affirm to the truthfulness of its content. Before giving this statement, I was told it should contain all relevant testimony, and I followed those instructions. I also understand that I can and must update this affidavit if anything new occurs to me until the moment before I testify in this case.

s/Trini Redbird
Trini Redbird
Dated: October 16, 2020.

Subscribed and sworn before me on October 16, 2020:

s/Roberta Bost
Roberta Bost