



UNA VOCE

April 2018

Vol. 25, No. 3

The Organization of Canadian Symphony Musicians (OCSM) is the voice of Canadian professional orchestral musicians. OCSM's mission is to uphold and improve the working conditions of professional Canadian orchestral musicians, to promote communication among its members, and to advocate on behalf of the Canadian cultural community.

Wise old owls and young spring chickens

by **Barbara Hankins**
Editor



At one time in the past 40 years, the age range of kws musicians was fairly small. Now there are long-tenured members in their 60s and newbies in their 20s. We need to be sure our committees reflect that, so that the wisdom of the elders is passed on and the fresh perspectives of the young inject enthusiasm

and new ideas. It's easy to let the "usual suspects" carry the load of union work and representation – and they probably do it very well. However to be sure the next generation has a chance to work with the oldies, a mixture is usually best.

So I give a "hats off" and back pat of gratitude to all of you who have volunteered countless hours to the betterment of your colleagues this past season. And a nudge to the young folk to explore where you can get involved and learn more about how our committees and unions function. It's not only Dracula who is looking for fresh blood.

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Una Voce readers are sure to find something that catches their attention in this final issue of the 2017–18 season. Mélanie Harel writes about Orchestre Métropolitain's successful European tour; Becky Whitling introduces us to Vancouver Symphony Orchestra's new conductor; Parmela Attariwala, who presented at the 2017 OCSM conference on the IDEA Declaration, gives an update of her research; Christine Little-Ardagh announces progress with the Career Guide; and Steve Mosher explains recent studies at Na-

tional Ballet of Canada Orchestra into sound levels in the pit. In January the Canadian music world lost an advocate and artist in Tommy Banks: read some tributes from musicians who knew him well. This year's centenary of Leonard Bernstein's birth is giving rise to many celebrations: we hear of a personal experience with Lenny from Kitchener-Waterloo Symphony flutist Tommy Kay.

Many thanks to all our contributors!

Orchestre Métropolitain in Germany, the Netherlands, and France

Mélanie Harel
Orchestre Métropolitain



For the first time in its history, the Orchestre Métropolitain (OM) is back from an international tour with its artistic director and principal conductor Yannick Nézet-Séguin.

The tour came into being after the OM was invited to perform at the Philharmonie de Paris, which led to the rest of the tour. From November 26 to December 3, 2017, the OM gave seven concerts: in the German cities of Dortmund (Konzerthaus), Cologne (Kölner Philharmonie), and Hamburg (Elbphilharmonie); in Amsterdam (Concertgebouw) and Rotterdam (De Doelen) in the Netherlands; and two concerts in Paris (Philharmonie de Paris).

The OM was joined by two renowned Quebec soloists – contralto Marie-Nicole Lemieux and cellist Stéphane Tétréault – as well as cellist Jean-Guihen Queyras and pianist Alexandre Tharaud.

Two different programs were performed on tour:



The Elbphilharmonie in Hamburg. Photo by François Goupil

Program 1

Mercure: *Kaleidoscope*

Berlioz: *Les Nuits d'été* (Marie-Nicole Lemieux)

Saint-Saëns: Cello Concerto No. 1 (Jean-Guihen Queyras)

Elgar: *Enigma Variations*

Program 2

Champagne: *Exil intérieur*

Ravel: *Concerto for the Left Hand* (Alexandre Tharaud)

Elgar: Cello Concerto (Stéphane Tétrault)

Debussy: *La Mer*

The musicians of the OM also had an opportunity to benefit from the talent and generosity of Montreal creators: designer Marie St-Pierre and the ALDO Group provided made-to-measure concert attire and footwear for all the musicians.

We can talk about this tour from many different angles – the quality of the organization, the very special ties that bind the musicians of the OM, the emotions on stage and in the halls – there is so much to say!

We received a very warm welcome from the public. Our seven concerts, for which we received no less than seven standing ovations, could even be described as triumphal. With such success, we would be remiss if we failed to mention the exceptional bond between the musicians of the OM and our musical director, Yannick Nézet-Séguin. At times on stage, the relationship could almost be likened to symbiosis. With Yannick at the helm, the orchestra gave its all. The tour became, not only a musical experience, but also a human experience characterized by great camaraderie and solidarity – among musicians, naturally, but also with the members of the administration, the soloists, and the technical staff.

A group of 18 music-lovers and OM fans (our groupies) came along with us to all the cities on the tour. During the day they would visit museums and historical sites, and in the evenings they attended the con-

certs. Rather than being put off by the idea of listening to the same programs night after night, they actually welcomed the opportunity to be able to hear the same works performed in different contexts.

Whether it was strolling along the canals or visiting the museums, everyone found something to do on their day off in Amsterdam. However, this was the last stroll for your devoted Monique Lagacé, former OM representative with OCSM, who fractured her foot the next day in Rotterdam, and had to miss the concert in Hamburg. She was able to play in the concert in Paris – with her cast covered by a black sock! Oh là là!

The highlight of the tour for me was discovering the remarkable acoustics of each of the halls we played in. New or mythical, a delight for the ears, or a feast for the eyes, they were all unique. And excellent. To play in such halls was pure joy – and also a privilege. Adjusting to the different acoustics of the various halls became a thoroughly enjoyable challenge.

From a visual standpoint, I have to give a hats off to the bold architecture of the breathtakingly beautiful Elbphilharmonie in Hamburg, which is built atop a former port warehouse. As for the listening experience from the perspective of concert-goers seated in the hall, I opt for the Philharmonie de Paris, with its warm yet focused sound. But my all-time favourite is the mythical Concertgebouw in Amsterdam: pure velvet! The entire concert was memorable. You could hear the orchestra literally take off in *La Mer*. I venture to suggest that, in the OM's collective memory, we now have a "before" and an "after."



The Orchestre Métropolitain in the Philharmonie de Paris. Photo by François Goupil

I came back from this tour full of recognition, and also pride, for the OM, which has certainly experienced one of the highlights of its history. The orchestra can rightly declare "mission accomplished."

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The concerts given on December 2 and 3, 2017, can be watched and heard on the Philharmonie de Paris site until the end of May 2018.

December 2, 2017, Philharmonie de Paris:

<https://live.philharmoniedeparis.fr/concert/1072554/>

December 3, 2017: Philharmonie de Paris:

<https://live.philharmoniedeparis.fr/concert/1072563/>.

Remembering Tommy Banks

by Matthew Heller

OCSM 1st Vice President



Tommy Banks, one of Canada's finest musicians and statesmen, passed away on January 25 at age 81. Many eloquent words have been written about him since, which seems only fitting for a person who embodied elo-

quence and sophistication in all his works. Below, we've reprinted two examples, excerpted from a CBC radio interview with bass trombonist Sharman King and from a tribute written by Edmonton Local President Eddy Bayens. Both are worth seeking out in their original forms.

Tommy gave a keynote address at the 2016 OCSM Conference in Calgary, where we asked him to talk about advocacy. He might easily have filled the hour with benign stories and platitudes from his time as a Senator; instead he delivered one of the most galvanizing talks I can recall ever witnessing. For him, advocacy wasn't about idle schmoozing or chatting up the powerful – it was about realizing our highest ideals as artists, and representing our fellow musicians as truly and forthrightly as possible.

* * *

[Sharman King, bass trombonist with Vancouver Opera, interviewed on CBC *The Early Edition* with Stephen Quinn:]

On performing with Tommy: I was just simply a member of the band. It was his superior mind that brought together musicians of all types, in all kinds of venues. Over the course of our time together we did over 300 hours of internationally syndicated music variety television, so it was a huge body of work there and it was all because Tom just went and did things. He was an amazing man.

On starting a new business: Through the 70s and into the 80s, there was so much variety television being done. With the changes coming in television, we saw

that wasn't going to last. So we simply looked for a business that we could do. We knew that we got along well together, along with Tom's ex-drummer Phil Shragge. So we came up with the idea of discount bookstores. They did it in Edmonton and Calgary and we did it out here, and it was very successful in Vancouver.

On Tommy's influence: He was a mentor to so many people, and in the course of Book Warehouse we had probably 1,000 employees at different levels. At one time, I'd love to tell, the whole trombone section of the Quebec Symphony was ex-Book Warehouse employees – his reach went wide. I would say his influence was one of high musical standards, and more than that, just the correct way to do things, to do business, and to have relationships with people. He went to grade 10, that's as far as he went; but he had a superior mind. He was a Churchillian scholar: lawyers consulted with him on contract writing because his English language skills were so succinct. He really wrote tight stuff. Whatever he touched, he made better.

* * *

[E. Eddy Bayens, from "Music Lost a Champion", Edmonton Musicians' Association newsletter, *Apollo* February 2018:]

Saxophonist Glen Acorn related a story to me about Tommy having booked a trio gig in a warehouse district in Edmonton north. When they got to the job, they found that there was no piano in the place. An evening of drums and bass was not an attractive prospect. The owner said that he may have an old accordion in the basement. Would that help? After the dust and mouse droppings were eliminated from that wind machine, Tommy played an evening of amended trio music. He never could refuse a challenge.

Bear in mind, few people are as gifted as he was in both his artistry and his business abilities. In addition, he had an insatiably curious mind that appeared to absorb, process, and retain information instantaneously. He was an extremely effective communicator, mainly because he was a perceptive listener. He made every person feel comfortable and important. He had an inventory of solutions for which problems had not yet been invented.

As a conductor, he provided constructive musical leadership that allowed a player to be his best, not through intimidation, as so many less secure people do, but rather through well-prepared, clear, and thoughtful direction. It was all done in the spirit of a true musical partnership, with a sense of humour, but never at the expense of another person.

Many of his activities could potentially have put him "on the other side of the table" from the Local, as

an engager of musicians. For Tom that was never an issue. His mantra was: “If it is in the interest of the musicians, that is the right thing to do. Where do I sign?” After all, who else can play the notes? All his engagements, and they were many, went by the book, including pension. No membership card? No gig.

Tom was instrumental in the building the Winspear Centre for Music, home of the Edmonton Symphony. It is an orchestral concert hall with outstanding acoustic qualities. He also created the Alberta Foundation for the Arts in conjunction with the Alberta Government. For many years he looked after the musical requirements of Edmonton’s Citadel Theatre, one of Canada’s most prominent and progressive theatres. When CKUA’s continued existence was threatened, Tommy intervened. As a result, that radio station is still on the air across Alberta and is doing well. While Tommy was not hesitant about being successful from a business point of view, his legacy is not what he took but rather what he gave to society and people individually.

Tom’s passing leaves a huge void that will take years to fill, if ever. On behalf of musicians everywhere, we offer our respectful condolences to his family. Whenever musicians go after they die, we may take comfort from the assurance that in that place this gentle genius is now busy writing great charts and looking after the players’ interests. First, take a well-deserved rest my friend. You left the world a better place. It is now our turn.

My Audition with Lenny

by Tommy Kay

Kitchener-Waterloo Symphony

This year the music world celebrates the 100th anniversary of the birth of Leonard Bernstein. This is my small tribute to a musician who had an enormous impact not only as a conductor but also as a composer and educator.

I met Leonard Bernstein when I was a student at the Berkshire Music Festival, Tanglewood, in July 1971. He was making his annual Tanglewood visit to conduct the Boston Symphony in Beethoven’s *Missa Solemnis* and the Berkshire Music Centre Orchestra in Act 1 of Wagner’s *Die Walküre*. He was also there to finish composing his *Mass*, commissioned by Jacqueline Kennedy Onassis to open the Kennedy Center in Washington D.C. He wanted a number of instrumentalists from the Center orchestra to play in those performances of *Mass*. I was invited to audition.

We were asked to choose a solo and then to sight read a selection from *Mass*. Was I nervous? What an un-

derstatement! Bernstein was my musical idol. I first saw him conduct on November 26, 1959, when my father, who was a jazz guitarist in New York, took me to Carnegie Hall to a performance by the New York Philharmonic for my eleventh birthday present. The program consisted of the Bach *Brandenburg Concerto No. 2*, Bartok’s *Concerto for Orchestra* and Beethoven’s Violin Concerto played by the great French violinist Zino Francescatti.

A new and wonderful world opened – and I was hooked. A year later our school music program subscribed to Lenny’s *Young People’s Concerts* and I attended them throughout my junior and high school years. Also through those years I saw Lenny conduct a number of great concerts, none more memorable than Mahler’s *Resurrection Symphony* on June 22, 1967, as a celebration of the New York Philharmonic’s 125th anniversary.

So now it was time to meet and play for this great musician. I spent the morning playing long tones so my nerves would not take control of my vibrato. Then I braced myself and went to the appointed rehearsal shed.

There sat Bernstein, waiting at the piano. He greeted me by name, we had a short chat (not one word of which I remember), and then asked what I was going to play. I had prepared the famous flute solo from Ravel’s *Daphnis et Chloë*. After I played the solo he was very complimentary and then asked me to play it again, but this time he would play the orchestral part on the piano, as he wanted to

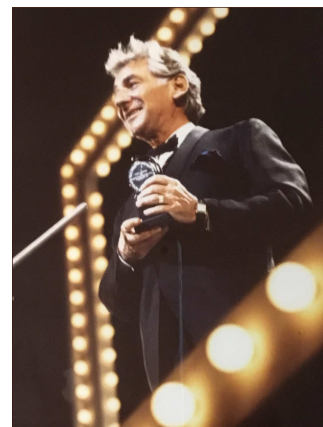


Photo of Bernstein taken by Tommy’s father from the orchestra pit at the 1969 Tony Awards

check my rhythm. The fact that he had no idea what I was going to play for him did not faze him as he knew the ballet from memory. Over the years I have heard other performers tell similar stories. Bernstein said he would start two measures before the solo begins. It felt as if we had been playing *Daphnis* for years. He then asked me to sight read the opening flute solo in *Mass*. Again, he wanted to check my time, so I played the obbligato solo once more with Lenny playing the orchestral part.

After we finished, he turned to me and said, “It was written for you. Would you like to play it?”

Otto Tausk's spark begins the VSO's next 100 years

by Rebecca Whitling

Vancouver Symphony Orchestra

On September 18, 2018, musicians of the vso will start our season under the baton of a new Music Director. The last time that happened, Jean Chretien was Prime Minister of Canada and cell phones had antennas.

Under the guidance of Bramwell Tovey, our outgoing Music Director of the past 18 years, the orchestra has grown in size and stature; we are now a Grammy and Juno award-winning ensemble, made up of 70 musicians, most of whom were granted tenure by Maestro Tovey.



Otto Tausk

Our new Maestro will be the 46-year-old Dutch conductor Otto Tausk. Born in Utrecht, Otto has been Music Director of the St. Gallen Symphony Orchestra and the Opera of St. Gallen in Switzerland since 2012. He served as Assistant Conductor of the Rotterdam Philharmonic from 2004 to 2006 and has worked with

other major orchestras such as the Concertgebouw Orchestra, Danish National Symphony Orchestra, and the L.A. Philharmonic.

An exhaustive three-year search process led to Otto's appointment. The search committee was made up of four board members, four staff members, and four musicians. The inclusion of orchestra-elected musicians on the committee is a new requirement, spelled out in our CBA, and meant to increase the musicians' involvement in MD selection. Online surveys for all guest conductors allowed for even more input from the musicians, as the results of the surveys were discussed extensively at search committee meetings.

Otto's spark with the orchestra was apparent from his very first rehearsal with us – that was for a memorably animated performance of Mozart Symphony No. 38 in January 2016. Since being named Music Director Designate, he has returned for programs that included Rachmaninov *Symphonic Dances* and Sibelius Symphony No. 1, both of which were artistically outstanding. Otto has also demonstrated a genuine, natural rapport with the audience.

Otto Tausk will lead the vso into our second century. The 2018–19 Season will mark the orchestra's 100th anniversary and, if all signs prove correct, the future for vso musicians will be bright.

Tempo égal: Setting the context for the IDEA Declaration

by Parmela Attariwala



Last summer, Orchestras Canada – the organization that advocates for orchestras with government and funders – introduced an equity document they call the IDEA Declaration: inclusion, diversity, equity, and accessibility. These words reflect contemporary Canadian values and

a socio-political aim to create a society held together by a belief in our equality as humans and by our right to participate equally regardless of our differences, be those differences physical, ethnocultural, or financial. Thus, the declaration is intended to address issues related to those who are excluded from Canadian orchestras or who, for a variety of reasons, are denied opportunities to participate equally.

Shortly after creating the IDEA Declaration, Orchestras Canada enlisted my services and those of equity specialist Soraya Peerbaye to undertake research on what equity means for Canadian orchestras, particularly in the current moment of gender and diversity awareness and of decolonization. How can we create more equitable circumstances, and what makes pursuing equity and accessibility in orchestras complicated? I had the opportunity to present some initial background at the 2017 OCSM conference in Gatineau. *Una Voce* has asked me to share this information here, along with recent updates. We will present our findings at the Orchestras Canada conference in June 2018.

Like other Western cultural institutions such as art galleries, theatres, and museums, orchestras (and those of us trained in Western classical music) have been the primary beneficiaries of public arts funding since the founding of the Canada Council for the Arts in 1957. As our political and legal system evolved to acknowledge a politics of difference (multiculturalism) and the rights of all Canadians to benefit from public funding, funders have gradually allowed other expressions of art to access public moneys. For some of us, this partitioning of funds away from a singular understanding of music has felt like an attack on our art form. Yet, Western classically trained musicians remain the only musicians in Canada who have sustained livelihoods performing and teaching the music in which they have been trained, while being protected by unions that guarantee a degree of fair compensation. By contrast, for musicians practic-

ing in other genres, union membership is optional and not a requirement of their performance infrastructure.

The problem confronting us now is that, while Western art music once represented the dominant ethnocultural sonic heritage of the majority of Canadian settlers, our demography is shifting radically away from being a predominantly European one. Meanwhile, both locally and globally, as well as politically and socially, we are confronting the devastating aftereffects of European colonizing impulses. A contemporary understanding of equity, therefore, means not only compensating artists fairly for their work, but fairly compensating artists across all demographics.

What, then, might equity look (and sound) like? The answer will be different for every community. The ideals of equity in Canadian orchestras – as in countries with diverse population – are similar to those affecting other expressive fields like theatre and television. When our stages, guest artists, management, and boards reflect the people we see on our streets, then our audiences will also reflect our communities. If this is not the case, then we must examine whether we have barriers that prevent, inhibit, or deter people from engaging with orchestral culture, particularly if they want to engage.

One of the barriers that American orchestras (in particular) have sought to address is mentorship of under-represented people of colour. Canada is distinct from other countries, though, because our multicultural framework actively showcases ethnocultural differences through the arts. As a result, we have many extraordinary musicians in this country, but they are musicians who maintain links to their heritage through its music, rather than through Western art music.

Nevertheless, some young people from historically disadvantaged groups (people of colour from former European colonies, Indigenous peoples, children from financially challenged backgrounds) encounter Western classical music through school or community music school programs. The students with promise, though, likely will not have access to the teachers, support systems, and mentorship they would need in order to strive for a professional career. Community music schools cannot pay the fees that high-calibre orchestral musicians expect as compensation for sharing their knowledge. Thus, the barriers to participation remain, as does the perception of Western art music's exclusivity.

Beyond our stages, structural inequity exists in our management teams and our boards. The internationalism that surrounds orchestras means that (in the larger metropolises) we tend to search for musical directors from an international pool, people who are often not invested in understanding the social turbulence affecting contemporary Canadian artistic culture. Players need to become

more involved in programming and in how the orchestra engages with the wider community. We have, at easy access, the possibility of engaging in creative endeavours across what may be the most varied range of artistic practices held in one geo-political space. Too often, though, we short-change the processes of meaningful exchange by insisting that collaborators outside the Western classical tradition adopt our schedule and our model of creation. Too often, we perpetuate the colonial trap whereby the composer who facilitates the exchange gets the credit, the copyright, the creation fees, and the accolades.

Lastly, we are at a profound crossroad moment of social change in all Canadian institutions of colonial heritage – between Indigenous resurgence and the #MeToo movement. The findings of the Truth and Reconciliation Commission have exposed the myriad of ways the colonial system has failed the people on whose land we live. For the music world, the fallout from the Canadian Opera Company's mounting of *Louis Riel* demands that we examine Western classical music's history of borrowing sounds from other cultures and that we re-hear them as culture stolen through acts of colonialistic appropriation. Meanwhile, the #MeToo movement casts dark shadows on the persistence of male privilege and power that continues to dominate our orchestras and tarnishes our place in the social ecology of Canadian culture.

How can we change *our* conversation? The original aim in establishing the Canada Council was to create a unique Canadian artistic culture. Are we ready to bring a uniquely Canadian perspective to the orchestral world?

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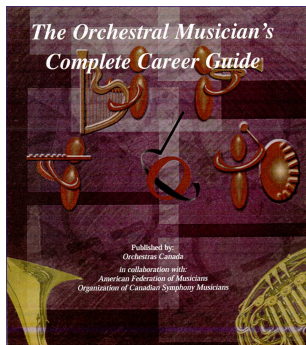
Parmela Attariwala is a violinist and violist by training, born and raised in Calgary. She worked professionally in Europe (Switzerland and the UK) for five years as a violist, and for the past 24 years in Canada as both a contracted and freelance player. She also holds a Ph.D. in ethnomusicology and has spent much of the past two decades thinking about the intersection of music and identity in Canadian culture.

Due to finite resources, our interviews for this research have been limited to management and individuals with unique perspectives on orchestras. I nevertheless welcome players' comments. I can be reached at: <parmela@parmela.com>.

The Orchestral Musician's Complete Career Guide

by Christine Little-Ardagh

Associate Director, Symphonic Services



In 1999, OCSM, Orchestras Canada, and the AFM collaborated on the publishing of a detailed and comprehensive *Complete Career Guide* for orchestra musicians in Canada. This opus was based on a much more modest publication printed in 1981 by the Association of Canadian Or-

chestras (the predecessor organization to Orchestras Canada) and written by Wendy Reid, administrator of Orchestra Openings for the ACO, with Christopher Weait, co-principal bassoon of the Toronto Symphony Orchestra at that time.

Wendy Reid had been running touring seminars for musicians called “Getting a Job in a Symphony Orchestra” and used the content from those sessions to create a small booklet as a permanent reference for young musicians and as a way to reach a wider audience. Christopher Weait participated in those ACO training seminars and taught at major universities and music festivals in both Canada and the United States.

In a preface to the 1981 book by Reid and Weait, conductor Mario Bernardi commented, “I have been hearing orchestral auditions for some twenty years and I would hate to think how many applicants I have seen fail, not so much for lack of talent, but simply because they did not know how to conduct themselves at an audition.”

The 1999 publication was published in binder format in order to allow for the addition of new and updated materials as needed. It enlarged and expanded on the basic information found in the original guide, which was entitled simply *Auditions Are Just the Beginning*. While the 1981 booklet was funded by the Canada Employment and Immigration Commission, the 1999 guide was made possible by contributions from the Cultural Human Resource Council, Yamaha Canada Music Ltd., and the American Federation of Musicians.

Both guides included a reading and resource list and covered topics such as audition procedures, preparation for auditions, working in a symphony orchestra, and preparing for an orchestral career. However, the much larger 1999 binder dealt with these topics in greater depth and detail; it had also added sections on

preparation of audition tapes, musicians’ health issues, and future trends, and included details about instrument insurance, transportation, and the AFM pension fund.

In August, 2015, at the OCSM conference held in Halifax, delegates working on the Editorial and Bylaws Committee revisited the then 16-year-old publication and committed to developing a newer, “spiffier” version of the *Career Guide*, more in tune with the current practices and standards in the music field and in a more easily distributed format. Since the fall of 2016 a committee including Barbara Hankins, Leslie Dawn Knowles, myself and Steve Mosher from Symphonic Services Canada, with input from Faith Schofield and Merrie Klazek, has been revamping the content and basic structure of the guide. The committee members believe that the guide continues to be a useful tool and that an updated version will provide helpful insights for young and early-career musicians as they embark on their path towards a position in a symphony orchestra in Canada.

In this newest version, hyperlinks to internet resources will replace long lists so that content may reflect the latest information available. Electronic formats will make the guide much easier to update on an ongoing basis, ensuring that the information provided is as current as possible. Resource lists are being rewritten to eliminate outdated and out-of-print sources while reflecting the significant shift to online information and learning.

Ultimately OCSM, in partnership with CFM’s Symphonic Services Division and with support from Orchestras Canada hopes to provide a dynamic, accessible and relevant resource for Canada’s young orchestral musicians.

We anticipate public access to the Career Guide by fall 2018. It will be available online through OCSM, Orchestras Canada, and the Canadian Federation of Musicians. Look for an update in the October *Una Voce*.

OCSM 2018 Conference

The 43rd annual Conference of the Organization of Canadian Symphony Musicians will be held from August 13 to 17, 2018, at the Hotel PUR in Quebec City. The first day will be for OCSM Delegates, Officers, and designated AFM personnel only; the full open sessions will begin at 9 a.m. on August 14. The hotel is located at 395 Rue de la Couronne in Quebec City’s Saint Roch district. All OCSM members are welcome!

Sound Levels Studies at the National Ballet of Canada Orchestra

by Steve Mosher

Associate Director, Symphonic Services



In June 2016, the musicians of the NBCO participated in a follow-up study that continued the process of measuring sound levels in the orchestra pit and of assessing possible hearing loss. The purpose of the first study from 2009 to 2011 was to map the noise levels throughout the pit so that we could introduce strategies to minimize exposure, or at least share the pain. Audiologist Alberto Behar took the lead on the study and his team supplied us with five dosimeters to measure the time-weighted average (TWA) exposure to noise. (TWA is a ratio which takes into account the sound pressure level and the duration of the exposure to determine how long a worker may be exposed to noise without adverse effect.) The ballet being performed was Prokofiev's *Romeo and Juliet*, one of the louder works in the repertoire, and the dosimeters were worn by different players for each of the eleven performances in the run.

Here is an excerpt from the Conclusion of the 2009 study "Noise exposure of musicians of a ballet orchestra" published in the online magazine *Noise and Health*:

The present work was an assessment of pit-orchestra musicians' risk of noise-induced hearing loss. We have highlighted several considerations for proper and efficient assessment of orchestra-related sound exposure, including the fact that the accuracy of the noise exposure measurement is within ± 2 dB. The measurements done . . . indicate that musicians of the National Ballet of Canada Orchestra are, in general, not overexposed due to performances alone."

Although the findings were not what we were expecting, they were consistent with similar studies conducted at the Canadian Opera Company and other orchestras. The study can be found here:

www.noiseandhealth.org/showBackIssue.asp?issn=1463-1741;year=2011;volume=13;issue=50;month=January-February

The results did, however, encourage us to step deeper into the research, and that led to the hearing tests in 2011 and 2016, plus a sound-shield study concurrent with the follow-up sound mapping of the pit.

Audiometric measurements

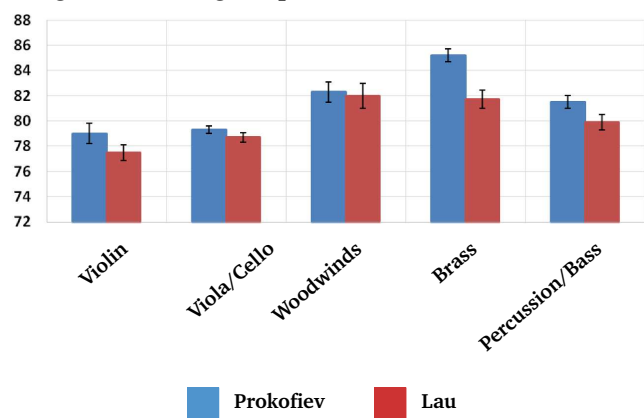
First, the good news. Hearing tests and a questionnaire for any interested musician were components of both studies. We had 44 participants for those tests in 2011 and more than 50 in 2016. Of that number, 40 were tested in both rounds and the age range of the participants was 25 to 70 years old. The results show that in those five years there was very little change in musicians' hearing.

Only two musicians had significant shifts in their hearing over those five years. The researchers involved in the studies conclude that the observed changes are "likely multi-factorial in nature including aging as well as non-occupational sources of noise. Because the exposure levels measured across studies were consistently below 85dBA we hesitate to make conclusions about whether the changes were due to occupational sources."

Comparison of the 2009 and 2016 sound mapping

The 85dBA referred to above is the TWA for the performances. Figure 1 is a comparison of exposures from 2009 and 2016. As expected, highest exposure levels (shown in decibels in the left column) were observed in brass, woodwinds, and percussion/basses. Of course we obtained significantly higher TWAs for individual instruments, up to 95 dBA, but they were averaged with the rest of the sections' readings.

Figure 1. Average Exposures and Standard Errors



Shield Study

The most surprising aspect of the studies was that the research indicates very little benefit, if any, from the use of protective shields in the orchestra pit. In 2016 we had a dozen dosimeters and we used them to take measurements on both sides of the shields. The music in this case was a new work by Kevin Lau on the story of *Le Petit Prince*. As indicated in Figure 1, the sound levels

were generally lower than the Prokofiev even with similar instrumentation.

The NBCO has two types of acoustic shields: Wenger and Manhasset. The Manhasset shields are slightly larger and they were placed in front of the brass and behind the violas and cellos; the Wenger shields were between woodwinds and percussion. Each set of measurements was done using two dosimeters. One was set up on the shoulder of the musician seated in front of the shield to measure the musician's actual noise exposure. The second dosimeter was set on the shield stand, positioned in the centre of and 10 cm away from the shield, representing the noise exposure behind the shield.

Table 1 (Orchestra – the study done during performances) shows that the Manhasset shield, on average, reduced the exposure by 2.7 dBA while the use of the Wenger had a negative impact (-2.1) on the musician it was supposed to protect. As always, there are variables which need to be taken into account. For instance, the distance between the brass and the Manhasset shields was about 2 metres, whereas the percussion was very close to the Wenger shields. If the placement of those shields were reversed, we could have had reversed readings. Another factor is the sound generated by the protected musician and of those adjacent. The back row of woodwinds produces more lateral sound than a stand of violas or cellos. Also, the percussion section is under the stage at the Four Seasons Centre, so sound is reflected off both the floor and the ceiling.

Table 1. Results of the measurements

	Manhasset	Wenger
Orchestra	2.7	-2.1
Post Study	9.2	5.9

For the Post Study in June of 2017, we solicited three players from the orchestra (flute, trumpet, bass trombone) to play an excerpt from *Swan Lake* while sitting one metre behind both types of shield in the empty and quiet Four Seasons Centre. They each played twice and the dosimeter on the protected side showed that the Manhasset reduced the intensity of the sound by an average of 9.2 decibels while the Wenger reduced it by 5.9.

The Post Study seems to confirm that the Manhasset shields are more effective at noise reduction but also that the attenuation by the shields is greatly reduced because of the sound generated by surrounding instruments. Combined with the results from the Orchestra study, it questions the benefit of the shields as protection. The important question that remains for the researchers: why do musicians like shields and feel protected when they are in place despite the data showing that they are not

effective? Obviously there is more work to be done to narrow down proper strategies for sound reduction.

Thanks to lead researcher Alberto Behar and his teams from the University of Toronto (2009–11) and Ryerson University (2016–17); Marshall Chasin for conducting the hearing tests; Les Allt, Richard Sandals, and Dave Pell for participating in the Post Study.

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“Noise exposure and hearing loss in classical orchestra musicians: A five-year follow-up” has been accepted for publication by *Canadian Acoustics*. “Sound attenuation of acoustic shields” has been sent for publication at *Canadian Acoustics*.

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UNA VOCE

is an official publication of the Organization of Canadian Symphony Musicians, and is published in both English and French versions three times per year. The deadline for the next issue is September 1, 2018. Inquiries may be made to Barbara Hankins (bhankins@gto.net). Contributors to this issue: Parmela Attariwala, Barbara Hankins, Mélanie Harel, Matthew Heller, Tommy Kay, Christine Little-Ardagh, Steve Mosher, and Rebecca Whitling.

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Newsletter typeset by Steve Izma, Kitchener, Ontario

English translation: Madeleine Mercy