THE CONDUCTOR'S WORKSHOP

A WORKBOOK ON INSTRUMENTAL CONDUCTING

R. GERRY LONG

Second Edition

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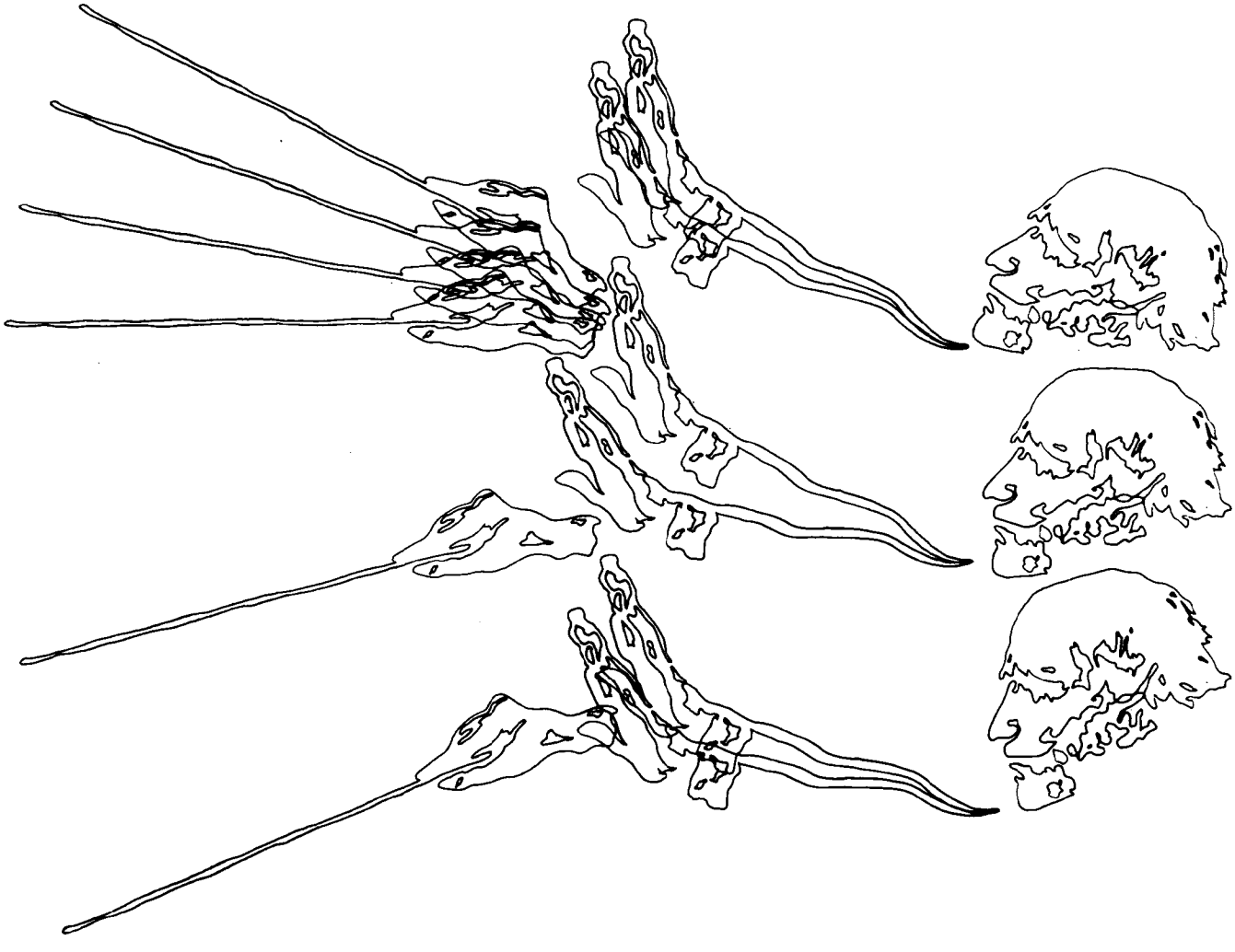
R. GERRY LONG
Ambassador College



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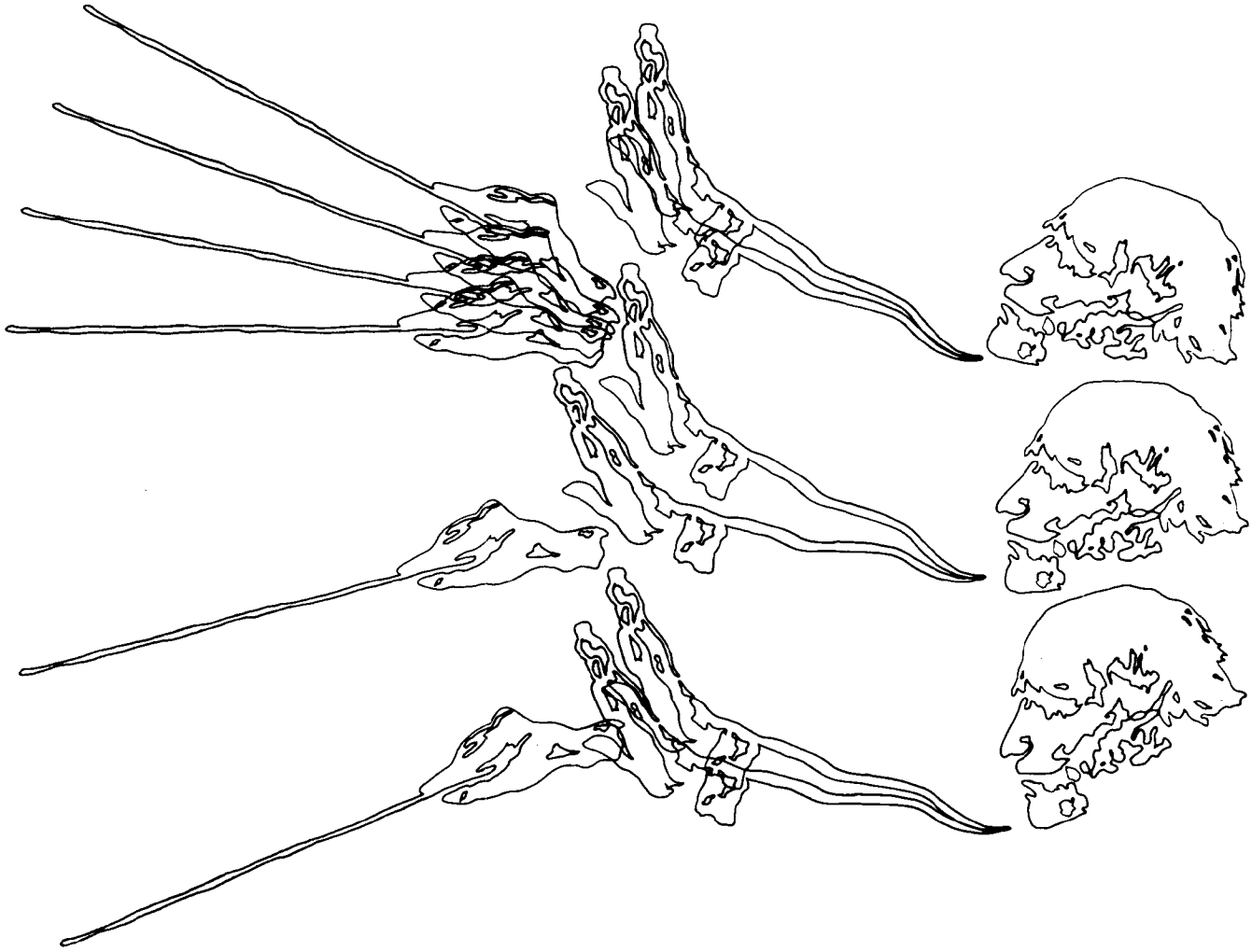


To Teta,
Joff, and Didi

PREFACE

The Conductor's Workshop, a workbook for the beginning conducting class, is written for the student who not only desires to develop a secure baton technique, but who also wishes to learn in the conducting class how to apply that baton technique in attaining high musical standards. The twofold purpose of the workbook is, first, to provide musical materials for a small ensemble so that such an ensemble can be available to the student in the conducting class and, second, to provide a teaching technique geared to the use of such materials, emphasizing the solution to fundamental musical problems which confront all conductors.

Having experienced the conducting class both as student and teacher and the orchestra as player and conductor, I feel that our music schools most frequently cannot provide the practical experience that is necessary in the training of conductors. This is due primarily to the inaccessibility of the school orchestra, the lack of usable conducting drill materials for a smaller ensemble, and the absence of an approach that is designed for a class in which a small ensemble is used and in which the students have frequent opportunity to experience the everyday musical problems that all conductors experience. It would be futile to assemble a small group of instrumentalists for which little usable music exists. Most music schools depend on the availability—however rare—of the school ensembles—band or orchestra. In my own undergraduate training, for example, my band conducting course afforded only one opportunity to conduct a university ensemble, and my orchestral conducting course afforded no such opportunity. This is not an unusual situation, and it seems that this problem can best be solved through the use of original musical examples for a small ensemble of musicians, with specific conducting problems in mind—a type of *Gebrauchsmusik*.

The absence of an approach designed for a class in which students are regularly conducting live musicians results in another serious weakness in conducting class methods currently in use. The hit-and-miss approach to the application of conducting technique—one day conducting a pianist, the next day in front of a mirror, the next day a recorded orchestra, and one day in front of the university orchestra—results in the inability of the student to get beyond baton techniques and into the musical problems of an ensemble. Therefore, most students coming from our music schools have some baton technique which they have had no opportunity to adequately test in front of musicians, and they have not been tested at all as to their ability to produce musical results with an ensemble of musicians. "Getting through" the assigned piece becomes the overwhelming goal. Making music frequently is not even considered.

Furthermore, the organization of nearly all textbooks on the art of conducting is such that these texts do not consider in detail the fundamental musical obstacles, other than that of baton technique,

which might contribute to the success or failure of a young conductor. The problem of tuning the orchestra, for example, is usually either completely ignored or, at best, given one or two pages.

The approach taken in this workbook is that of stressing baton technique, applying baton technique in front of performing musicians, and also emphasizing those ensemble fundamentals that a conductor must control in order to guide an orchestra to an accurate, convincing, and expressive interpretation. If the conducting student is not made aware of the urgency of achieving the best possible musical results with his fellow students, he may set a pattern that makes it difficult for him to accomplish this task with any performing group.

This book attempts, therefore, to fill an existing void—the lack of original material for the small ensemble that can serve the conducting student in class.

Since publication of the original edition of the book, I have had the opportunity to conduct local orchestras in about seventy-five cities of the United States, Canada, and Mexico. I took this opportunity to visit music schools in most of these cities, doing conducting clinics and talking to conductors, teachers, and conducting classes.

Most of the changes in the new edition were suggested by those teachers who had been using *The Conductor's Workshop* in their own classes. I wish to thank those individuals, and particularly those who took the time to evaluate the book for the publisher.

Changes include primarily the lengthened and improved classification of the conducting examples of Part Two and the inclusion of material on score preparation.

My deepest gratitude is extended to those individuals whose generous assistance helped to make this book possible. They are Dr. Norman Hunt and Dr. Frederick Westphal of California State University, Sacramento, Dr. Glenn R. Williams and Professor Ralph G. Laycock of Brigham Young University, Dr. Vernon B. Read of San Jose State University, Dr. Kenneth Gene Eaves of the Beverly Hills Public Schools, and Mr. Norman Carol, concertmaster of the Philadelphia Orchestra. To Mr. Carol's colleague in the orchestra, Mr. John De Lancie, principal oboist, who gave many hours of his time in providing the perspective of a musician who has played under virtually every great conductor of the past twenty-five years, I owe a special debt of gratitude. I wish also to express my thanks to Mrs. Irene Gallagher for her assistance in typing—ever so patiently—the manuscript.

R. Gerry Long

INTRODUCTION

CONDUCTING "LIVE" MUSICIANS

The most obvious way to learn to conduct a musical ensemble, such as an orchestra, or a band, is to practice conducting live musicians. Conducting a recording, a pianist, or one's mirror image, though somewhat helpful, is not adequate. Usually the large ensemble—orchestra or band—is not available to the student for practice. Most often in a conducting class when a student is finally given his long-awaited opportunity in front of the university orchestra, he is petrified. Why? Because he has never had an opportunity to try out even such a simple gesture as the downbeat with an ensemble, to say nothing of his crescendo, his cut-off, his cuing, and all other simple gestures which can become immense problems when used all at once in a work of relative difficulty such as a Beethoven overture.

When the downbeat is introduced in class, each student should be able to try out that gesture with live musicians—even though only two or three musicians may be available. The same is true for the introduction of all other new gestures. In this way, the student's initial conducting experience with an orchestral composition might well be his twentieth time on the podium. Present conducting training programs, in which an orchestra is seldom available, are inadequate. A small ensemble of live musicians must serve as a substitute.

Many of the problems of conducting such a small ensemble are the same as those problems encountered in conducting an orchestra or a band. (Since the wind band [*Blaskapelle* or *Blasorchester* in German] is an orchestra without strings, the term "orchestra" will refer to a wind band as well as the traditional orchestra with strings.)

The use of a special small ensemble is very rare because of the absence of musical materials for such a group. Max Rudolf, in his book *The Grammar of Conducting*, includes some conducting examples which he has composed for piano. He recommends that they be arranged for a small orchestra, though I know of no conducting class which has actually done the arrangements. Such literature should present the type of problems which would offer a challenge to the young conductor, while at the same time not requiring virtuoso chamber musicians to perform the music. A Haydn quartet movement, for example, would be—for the student conductor's purposes—too easy to conduct, and too difficult to perform.

Contained in this workbook are over two hundred original examples of music for small ensembles which are, with a few exceptions, easy to perform but challenging to conduct.

EXPERIENCING REAL PROBLEMS

Naturally an orchestra (or band) would serve the purpose of a student conductor most adequately. But since these groups are rarely available, the student must find an alternative experience. The con-

ductor must somehow experience—and be guided in the solution to—such problems as a poor attack, a missed entrance, the confusion created when he conducts three-four instead of four-four time, and an ensemble which drags or rushes the tempo. He must also experience wrong notes, poor intonation, lack of dynamic contrast, questionable tone quality, ragged rhythmic ensemble, and insensitive interpretation. All of these problems of ensemble musicianship can be observed and corrected in a small ensemble, much as they must be observed and corrected in a full orchestra. If a conductor does not recognize weak ensemble playing in a trio, he will not recognize it later in a full orchestra.

Each of the examples in the workbook has been composed to stress a specific conducting problem. They have all been composed with emphasis on technical simplicity, so that they may be played by almost any three instrumentalists having the performance proficiency of the average college sophomore. For this reason the conducting examples utilize simple keys and technically uncomplicated melodic patterns. Another reason for using such simple melodic materials in the musical examples is to free the student conductor to begin his conducting experience with concentration on extremely simple musical fundamentals (i.e., a triad played well in tune by three instruments, quarter notes and eighth notes fitting together perfectly, clean articulation or bowing, etc.). There is no point in moving on to an overture until the student proves himself capable of attaining these fundamentals with an instrumental trio.

ORGANIZATION OF THE CONDUCTING "TEAM"

The musical examples of Part Two, composed for the conducting class, call for a specific physical set-up for a group or groups of four students, with three or more students performing while one conducts. If the class is larger, two or more "teams" of students may work in groups of four. If there are one, two or three extra students, they can be added to one or more teams of four to alternate with the other students and to observe and criticize. The music is written for many combinations of instruments —using treble, tenor and bass parts (i.e., clarinet, alto sax, and trombone; or violin, viola and bassoon). All parts are written in concert pitch, necessitating transposition by non-concert pitch instruments. Since most conducting classes are offered in the junior or senior years, instrumentalists will have generally reached a level where transposition should not be a major problem, or their proficiency in a minor instrument will have developed to a degree which will enable them to change instruments for a class rather than to transpose. (A violist might play cello in the class.)

TWO PRIMARY OBJECTIVES

The immediate purpose of this approach to conducting, as suggested in the preface, is to provide an ensemble of live musicians with which to apply and test the student conductor's technique. Perhaps even more important than a test of the conductor's technique though, is the opportunity for the teacher to observe the conducting student in each class period under actual conducting conditions. Only in the presence of a live performing group will the teacher be able to observe the student's reaction to shoddy execution of musical fundamentals after the student has developed some security in his baton technique. In other words, the student should not only conduct well, he should demand from the ensemble the highest level of performance.

It is the conducting teacher's responsibility to make the student aware of musical fundamentals such as tone, intonation, articulation, bowing, balance, rhythmic ensemble, and interpretation, and to see that he pursues the proper execution of these fundamentals with his every conducting gesture and comment.

DEMANDING MUSICAL RESULTS

The student conductor's ability to achieve with the other musicians not just an execution of the conducting exercise, but a *performance* of the highest level in regards to all musical details (tone, in-

tonation, rhythmic ensemble, articulation, bowing, balance, and interpretation) will depend on a variety of factors. Certain of these factors, such as the student's personality, his personal relationships with the members of the ensemble, his organizational ability, etc., are, to a degree, outside the province of this workbook.

However, the most important factor which influences the conductor's ability to obtain good musical results from his musicians in his own musicianship. This should be the *prime* concern of both the student conductor and the teacher. For if the student should complete the conducting course with a superb baton technique, and in the process of learning such a technique, he should not develop high standards of ensemble performance, half of the value of having had live musicians present will have been lost. And what the teacher can expect the student conductor to achieve with the ensemble cannot exceed the student's own musicianship. *The quality of performance of an ensemble is very much a mirror of the musical thinking of the conductor of the ensemble.*

ASPECTS OF MUSICIANSHIP–FUNDAMENTALS

The approach taken in this workbook to the development of musicianship is based on my own breakdown of general musicianship for the conductor into isolated fundamentals or concepts already listed above as tone, intonation, rhythmic ensemble, articulation, bowing, balance and interpretation. Another important fundamental, that of technical accuracy (playing the correct note—e.g., D♯ as opposed to D), will not be included, as it is too obvious and of all of the fundamentals perhaps the least overlooked. And if the conductor cannot begin by demanding the notes as printed in the score, there is no point in considering such "complexities" as intonation and interpretation.

The fundamental concepts which will be stressed are listed in an order which is based on my own personal preference. The order is of little importance anyway, as long as all of the fundamentals are eventually covered. I feel most inclined to begin with tone, then intonation, without which no musical performance can sound satisfactory.

When tone and intonation are highly polished, there has been established in the orchestra a concrete foundation which can enhance the execution of such fundamentals as rhythmic ensemble, articulation and balance. Interpretation is mentioned last not for reason of its lack of importance, but because it is a combination of all musical fundamentals well executed and more, and it must be sought at every moment in a rehearsal.

Until a conductor has developed in his "inner ear" a concept of these fundamentals–good tone, intonation, etc.,–he will be unable to demand from an orchestra a musical execution of these fundamentals, and consequently, of any complete composition.

THE ROLE OF BASIC MUSICIANSHIP

A successful conductor must first be a good musician. Whether or not this sounds naive or cynical, there can be no doubt that there are many unmusical conductors who have the courage to step onto a podium. Consider, on the other hand, the musical capabilities of great conductors, past and present, in their non-conducting roles: Mitropoulis, Szell, Bernstein, all excellent pianists; Ormandy, violinist; Katims, violist; Toscanini, cellist; Koussevitzky, bassist; Colin Davis, clarinetist, etc. A conductor who has not experienced the problems involved in making music with other musicians (intonation, balance, tone quality, articulation, rhythmic ensemble, interpretation, etc.), will not have the experience to draw upon when he has to guide four horn players in tuning a diminished seventh chord, when he must encourage more soulful playing on the part of the solo oboist in Strauss's *Don Juan*, when the woodwinds sound muddy in Mendelssohn's *Midsummer Night's Dream* Scherzo, or when the cello and viola sections do not blend in Brahm's *Haydn Variations*.

It is true that one occasionally meets a rather successful conductor who has not been a *virtuoso* performer. This is a rare musician who has exceptional insight regarding the performance of music.

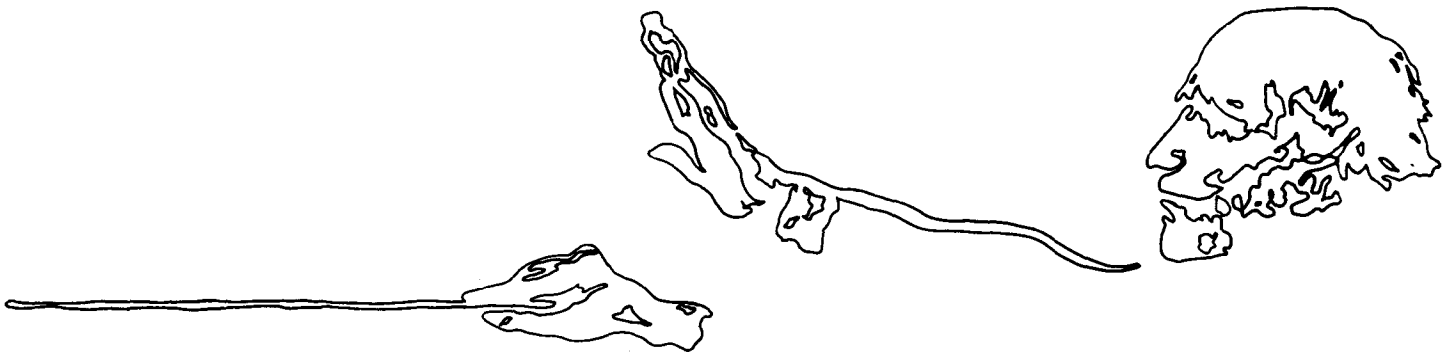
His lack of experience on an instrument is frequently replaced by an insatiable curiosity about performance from the standpoint of pedagogical understanding. In this case, his substitute for a personal performing experience is an *exceptionally* well-trained ear, which is developed through endless listening experiences. An eminently successful conductor of a college concert band, and a nonperformer, never misses the Metropolitan Opera performances in Detroit even if he must use standing-room-only tickets. Through a lifetime of this type of concert-going he has developed unusually fine concepts of performance which he passes on to his musicians.

But for every one such musician who has developed his musicianship in spite of the lack of a personal performing experience, there are many non-performers who are not correcting shortcomings in their musical training. Often the priceless benefits which come to the perceptive listener are missed.

It certainly seems unlikely that a person who has never developed a performing skill on an orchestral instrument could ever become a skilled conductor without a wealth of perceptive listening experiences.

CONTENTS

PART I



CONCEPTS AND FUNDAMENTALS

The key word in a conductor's development should be *concept*. Without an orchestra in front of him, what can the conductor conceive or picture in his "inner ear" at the mention of such things, for example, as good trombone tone, a major-minor seventh chord (in tune), woodwind articulation, the brass passages of Siegfried's funeral music in Wagner's *Götterdämmerung*, a cymbal crash (not just careless banging of two cymbals together), rubato in an ascending and descending arpeggio, the exciting sound of a string quartet playing a ff tremolo, or even the sound of a single violinist drawing forth maximum tone from a single half note? All of these, plus thousands of other more elaborate musical pictures must be conceived in the conductor's ear and made real by him through his orchestra.

The sound produced by any orchestra will lean towards the sound which is anticipated by the conductor. Within reason, what the conductor wants to hear—the conductor's concept—should eventually come from the orchestra. Most weak orchestras are the products of conductors who have vague concepts, or who cannot communicate their concepts to the orchestra. Of course, there are limitations in what a conductor should expect within each orchestral proficiency level. A conductor should not expect a high school orchestra with three amateur string basses to sound like a major symphony

with ten professional string basses. But the same high school orchestra should be approached with the intent that it will sound like the *best* high school orchestra. So it is that the Denver Symphony, for example, while not attempting to imitate the Philadelphia Orchestra, should strive for such lofty concepts of pitch, tone, etc., as one finds in the Philadelphia Orchestra.

DEVELOPING CONCEPTS

The development of such concepts requires a life-long involvement with ensemble performance. Students occassionally seek advice on majoring in conducting. My first advice is to become as proficient as possible on a major instrument and the piano. Through proficiency on the viola or oboe, for example, a student will experience the problems of expressing music individually, and through increased proficiency, he will be taken into better ensemble groups, to experience a higher calibre of ensemble performance. One eminent conductor suggests that no one should become a conductor until he has exhausted the expressive possibilities of his own instrument.

A young musician who can serve effectively as player-coach for a string quartet, woodwind quintet, or brass ensemble, has completed a number of the rudimentary steps to becoming a good conductor. In the process he has developed good concepts of tone, intonation, articulation, bowing, balance, rhythmic precision, and expression, and he has applied these concepts in working with other musicians. These are the primary involvements of a conductor.

A concept of the proper execution of each of the fundamentals—tone, intonation, articulation, bowing, balance, rhythmic ensemble, and interpretation—must be pursued by the conductor relentlessly. An orchestra which has overlooked the fundamentals of tone, intonation, balance, and phrasing and cannot sight-read a chorale beautifully may never play it beautifully, since the performance of that chorale demands simply a musically sound execution of those musical fundamentals in a simple composition. A conductor who does not have a highly developed concept of these musical fundamentals will never produce a thoroughly musical organization whether his group be a high school orchestra or a major symphony orchestra. "Only a man . . . whose conception of the work does not dwarf it, and who is capable of lifting his medium up to the level of that work is worthy of the name of conductor."[1]

PIANO BACKGROUND

All of the great conductors who have taught conducting recommend a background in piano, which must include transposition and the reading of unusual clefs such as alto and tenor. A conductor with keyboard facility will not only be better able to find out what is contained in an unfamiliar score, but he will be better able to "think harmonically." Musicians who have played a single line instrument are not as likely to be able to imagine a progression of chords without hearing it played. Pianists are less likely to hear a composition as a combination of melodies for different instruments, but rather as a vertical structure. In keeping with the idea of developing concepts, a harmonic concept can best be developed through knowledge of a harmonic (i.e., a keyboard) instrument. The aspiring conductor should train his "inner ear"—his musical imagination—so that he can look at a simple chord progression and hear the harmony without the aid of a piano. The piano background will aid in developing this ability to imagine a sound before hearing it. The conductor must be able to imagine the sound of full chords, the sound of two or more melodies being played simultaneously, and the sound of the rhythmic sweep of the music. A capable conductor can encounter an unfamiliar work from the Viennese Classical period, for example, and learn the entire work—developing an accurate aural picture of the work—without hearing an orchestral performance or playing a piano reduction of the work.

1. Herman Scherchen, *Handbook of Conducting* (London: Oxford University Press, 1933), p. 3.

The student who develops an interest in conducting without having had adequate piano experience must develop enough piano technique and reading ability to at least play slowly through an orchestra score. Many conductors shy away from contemporary works after attempting them with their orchestra because they cannot hear the sonorities which the composer intended. With a piano it is possible to take the time to analyze each unusual sonority—to dissect it—to relate it to traditional sonorities—in short, to understand the sonority so that he can enlighten his musicians as he exposes them to a new work, rather than entering into it as he would enter a dark and unfamiliar forest. The conductor must guide the orchestra into new worlds of sound but he must first know the terrain.

ORCHESTRAL FUNDAMENTALS

We have earlier expressed the belief that highly developed musical concepts of orchestral fundamentals can best be achieved through artistic accomplishment on an instrument. However, there are certain means for improving such concepts for those who have not had an extensive background on an instrument, and for those who are interested in a broader approach to developing musicianship. Part One of this workbook contains suggested steps for pursuing such improved concepts. It is suggested that each student read these chapters thoroughly, and that they be discussed in the conducting class before and during the involvement with the conducting examples of chapters seven through thirteen.

All of the fundamentals of orchestral performance discussed in the following chapters are important to the conductor who is preparing himself to conduct an orchestra. Some conductors have consummate knowledge of baton technique and orchestral repertory, but are lacking in knowledge of basic orchestral fundamentals. Many of these conductors are aware of their weaknesses and are taking the necessary steps to correct them. Others, however, remain frustrated by the problems within their orchestra which they cannot solve because they do not have the technical knowledge to solve the problems.

THE NEED FOR ADEQUATE PREPARATION

Their dilemma is that although there may be a number of professionally qualified musicians in their orchestras, they themselves are not equipped to help the non-professional to develop towards professionalism. A conductor cannot simply resign himself, for example, to the harsh sound of an oboist just because the oboist is a lawyer by profession, or an elementary school band director, or a college sophomore. We cannot expect that every conductor will know how to make a more pleasant sounding oboe reed, but he should know that a different oboe reed will produce a different sound, and that a stiff reed is the cause of the harshness and the inability to attack with control, and that a reed which is too soft may cause an uncontrolled pitch. The conductor of a semi-professional orchestra must know these details. Should not conductors of fully professional orchestras also be expected to know them?

A conductor should allow time to prepare himself for every rehearsal and concert. Absolute professionalism requires a great commitment of time—time to learn fundamentals, time to study scores, time to continue to improve one's own instrumental ability, time to read and develop one's artistic and aesthetic tastes, time to compose and to orchestrate, time to listen perceptively, and time to think.

Many conductors accept too many obligations and do not have the time to prepare themselves adequately for each concert. A young conductor might endanger his entire professional career by accepting engagements without time to prepare them. Above all, the conductor must allow himself time to become familiar with every detail of the score. He must study each work until he is

acquainted with each melody, each countermelody, each accompanying figure, each rhythm, each chordal sonority, etc. He must sing every voice in order to know in advance any unusual problems which will occur. He must sing each voice while imagining other voices in relation to the one he is singing. He must anticipate and plan a solution for each problem which will arise.

He must know each work, not only from the standpoint of all of its inner detail—its microcosmic nature—but also from the standpoint of its macrocosmic nature—its relation to the composer's other works, the period which it represents, the philosophical ideas of that period, other aesthetic trends of the time in art, theatre, literature, etc. He must above all understand the architectural structure of the work—the form. If an architect is assigned to reconstruct such a structure as the Parthenon, or a similar structure, he would have to make an exhaustive study of the function of each part in relation to the whole. If a theatrical director wishes to stage *Hamlet*, he must do likewise—study the function of each part in relation to the whole. The conductor's task is like that of the theatre director, to recreate each work he conducts with the utmost understanding of the composer's intent. He must therefore know the architecture, or the form of the work.

Certainly his own musicianship will influence the composition's final shape, but the basic design has been established by the composer. The conductor must arrive at his concept of this design through devoted study and preparation in advance of the first rehearsal. Even a finely trained musician who has not prepared adequately before a rehearsal faces a loss of respect from his musicians.

If a conductor always allows himself time to prepare each program so that it will equal or surpass the artistic level of his previous program, he will continue to grow because he will force a constant re-examination and improvement of his concepts.

Let it be understood that the art of conducting, like the art of becoming a fine human being, is a never-ending search. No one has ever perfected the art, though several have developed it to an inspiring degree. No conductor has been all things to all musicians or to his audience. Every conductor has his weaknesses. Therefore each conductor must, in his own way, strive to progress as a musician throughout his life. It is the hope of the author that this workbook will aid some young conductors in the lifetime quest to conduct effectively—to be truthful to the art.

ORCHESTRAL FUNDAMENTALS AND INTERPRETATION

We have stated that one of the two main objectives of this approach to the study of conducting is to instill in the student an awareness of the basic musical problems (fundamentals) which confront the conductor. These problems or fundamentals already listed and discussed, such as tone, intonation, rhythmic ensemble, articulation, bowing, balance and interpretation, must be conceived and approached individually, because if any one of them is overlooked in training an ensemble, the overall musical results cannot be satisfactory. If, however, through intelligent and vigorous effort the conductor can achieve a high degree of mastery of each of these six fundamentals, the musical results thus obtained cannot easily be criticized.

The following chapters are devoted to methods of approaching all but the last of these fundamentals, that of interpretation. Interpretation is omitted because, as was pointed out in the introduction, interpretation is the sum of all other fundamentals, plus much more. A workbook of this sort is not the means through which interpretation can be taught. At best we could list some general concepts of rubato, dynamic contrasts, bowings, tempo, etc., and some philosophical ideas on the subject.

A musician's concept of interpretation is dependent on many and varied factors, such as his proficiency on his own instrument, his experience as a listener, his general perception, his innate talent, his life experiences, which effect his philosophy and aesthetic judgment, his ambition, and his emotional make-up, etc. Perhaps one of the most interesting studies of interpretation is to be

found in recorded music. One can compare, for example, two performances—one conducted by Serge Koussevitzky, the other by Leopold Stokowski—of the third movement, *Poco allegretto,* of Brahms' *Third Symphony* in F minor, Op. 90. Here one can find two extremes in such important matters of interpretation as tempo, use of rubato, and balance between solo voice and accompanying instruments. The contrasts are quite remarkable.

The other five fundamentals are more concrete, tangible fundamentals. They are technical, rather than aesthetic, and can more easily be controlled. Our objectives in considering each one individually are 1) to make the student more aware of each fundamental as a potential obstacle to good orchestral playing, 2) to develop an improved concept of the best execution of that fundamental, and 3) to suggest means through which the student can find solutions to the problems which relate to that fundamental.

PREREQUISITES FOR THE CONDUCTING CLASS

The conducting class which makes use of this workbook should be so scheduled in the music curriculum as to insure that each entering student will have at least the minimum essential musical background. This should include, in addition to a sufficient skill on an instrument (a voice student should have adequate piano facility), a well developed rhythmic, melodic, and harmonic skill. The following music courses should be offered as prerequisites for the conducting course, if possible:

1. **Harmony:** two years or more; knowledge of traditional intervals, triadic harmony, including 9ths and 11th chords, non-harmonic devices; some knowledge of more contemporary concepts of harmony (e.g., quartal harmony, serial harmony, polytonality, etc.).
2. **Ear training:** aural familiarity and understanding of the above listed materials; sight-singing ability including facility with tenor and alto clefs; considerable rhythmic skill; competence in reading the examples listed in chapter eight, pages 73-75, without serious difficulty.
3. **Keyboard:** at least two years for the music student whose major instrument is not piano.
4. **Music history:** at least an introductory course, but as much additional history as possible. Courses with period specialization (i.e., Baroque, Romantic, Viennese Classical, Impressionism, etc.).
5. **Acoustics:** knowledge of the harmonic series as applied to a) tone quality of individual instruments, b) relationship of string or air column lengths to the basic intervals and their mathematical ratios; basic knowledge of the physics of sound transfer; rudimentary knowledge of the principal of equal temperament and of pure intervals; acoustical structure of stringed instruments, wind pipes, percussion instruments, etc.
6. **Orchestration:** at least an introductory course.
7. **Instrumental methods:** as many of the required instrumental methods classes as possible, including voice or choral participation.
8. **Form and analysis:** at least a semester.