HENRY W. TAYLOR

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HON. R.C.M.

Professor of Timpani, The Royal College of Music, London;
Formerly Timpanist, The London Symphony Orchestra

THE ART AND SCIENCE OF THE TIMPANI

JOHN BAKER

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AUTHOR'S PREFACE

THIS is not a tutor! I make no apologies for being unable and even unwilling to attempt to teach the complex technicalities of timpani playing — from the pages of a book. It cannot be done! Rather is it an attempt to put before my readers the results of a number of interesting quasi-scientific experiments on sound, tone, and tuning as applied particularly to the playing of drums. The amateur or novice will, of course, glean much that he otherwise would not have known, but the book is written primarily for the established drummer who, in this precarious world of orchestral music, has found perhaps little time or opportunity to explore the finer points of his craft. I have known many such — capable players of all kinds of drums for upwards of twenty years; yet to many of them, 'fine' tuning is either an elusive mystery or a happy accident occasionally achieved.

They look sadly at the timpani heads and say, 'Skins are not what they used to be', not knowing that the skins may be indifferently lapped, that they are playing on an impossible spot, or that the sticks they are using are as likely to produce good tone as a bone club on a native tom-tom. They proceed to play a roll as fast, and as 'close', as a xylophonist, and wonder why the sound is muffled, has no carrying power, and why they are fatigued after a dozen bars of *fortissimo*.

It has been said that 'an ounce of practice is worth a pound of theory'. This is only half true. If the ounce of practice represented by twenty years of such playing can only achieve bad tuning, poor tone, and a complete lack of understanding of the whys and wherefores of the

timpani, then it is high time that the pound of theory was introduced into the practice.

It is to such players that this book may make its best appeal. That it will give rise to argument, criticism, even contradiction, I have no doubt.

It is rare indeed, and I think this is true the world over, that the timpanist of a good orchestra is under thirty or forty years of age, though it is not because the technique cannot be mastered until middle age: the contrary is possibly the case. Is it not rather because the accumulated wisdom of twenty years of playing drums of all kinds, and in all kinds of musical combinations, is essential to the sense of mastery, the stability, the certainty of 'attack', and the sense of 'seeing' more than appears on the printed 'part'?

All these elusive qualities are slowly and subconsciously acquired, and cannot be taught. Herein lies the answer to the question, 'Why are there so few fine timpanists?' In a great city like London, during the past fifty years, a conservative estimate of players who reach this standard has never been more than eight at any given period.

I commend to my friends the book by that eminent investigator into timpani lore, Professor Kirby, M.A., *The Kettle Drums* (Oxford University Press). Here are many interesting and valuable data on the theory of the harmonic series, particularly in its application to timpani. I shall attempt to carry on experiments where Professor Kirby left off. I acknowledge with gratitude the invaluable assistance of his researches, and trust I shall break fresh ground, rather than merely tread the path so splendidly blazed by him.

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ILLUSTRATIONS

DIAGRAMS OF SHAPES OF SHELLS

This book is dedicated to
BASIL CAMERON ESQ, C.B.E.
in recognition of his wisdom
and understanding of
Drums and Drummers.

There is magic in rhythm
—GOETHE

1

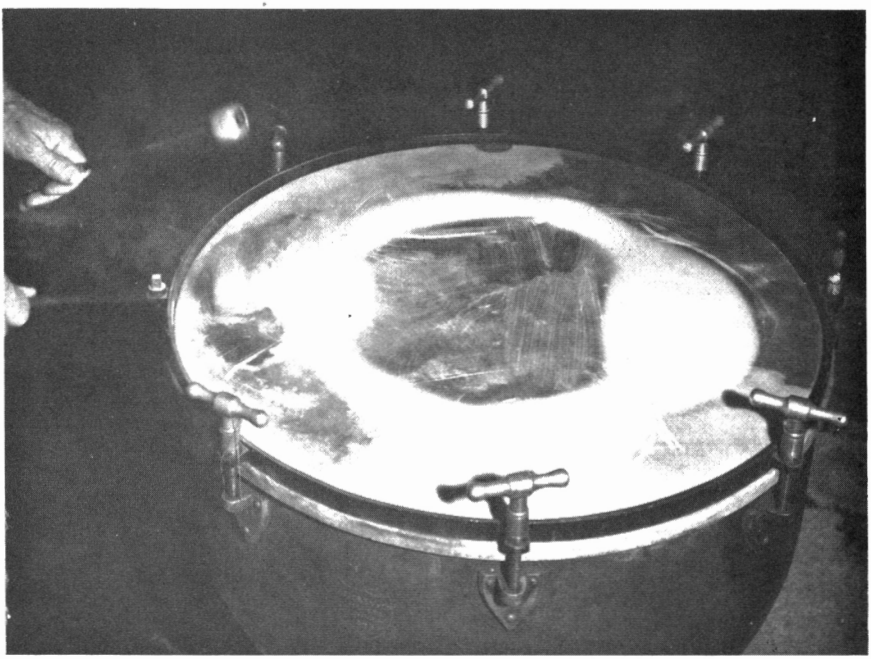
Production of the Note—The Sound-Wave—Harmonics—Preliminary Experiments

A MUSIC dictionary gives the following definition of a musical sound: 'A regularity of vibrations which are periodic, and of uniform length.'

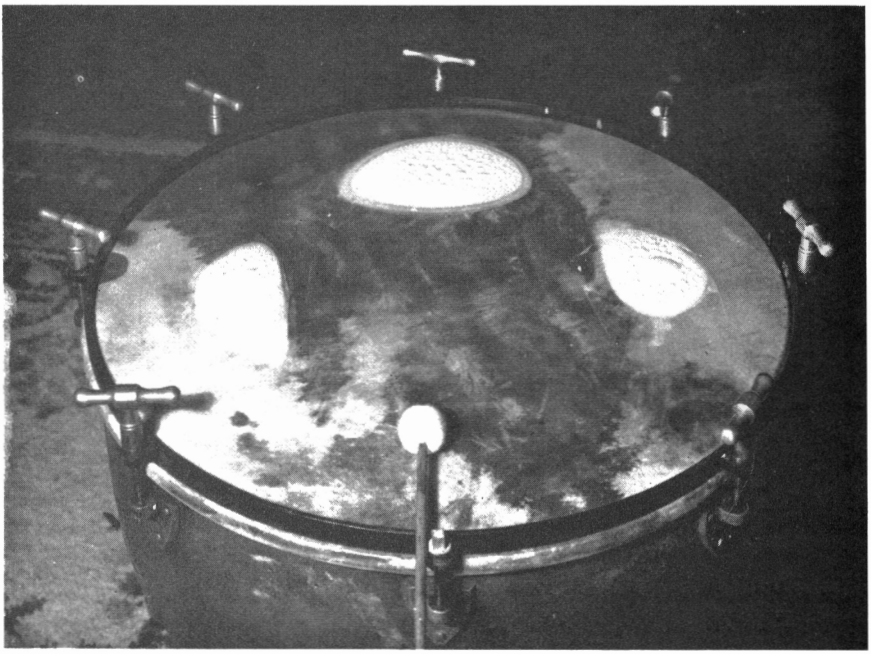
To this we may add the familiar analogy of the stone in the pool — an even succession of waves or ripples until they fade away — or *unless and until* the wave meets an obstacle to impede its ordered progress; then it cannot conform to the pulse set up by the stone, for its contour is changed. A musical sound is affected in a like manner.

Consider a piano wire. It is 'even' throughout its vibrating length; it has no obstacles to impede its vibrations. Unless it is stopped by a damper, it will sound for a lengthy period, and retain its pitch or frequency (vibrations per second) even while it gets quieter, and until it fades (to the human ear) entirely.

The piano wire is straight, unhindered, and most firmly fixed at its extremities. It is stopped literally only at two known points. Its tension is regulated merely along its vibrating length. The result is fairly sure to be what the maker and the tuner expect: a good note with some harmonics present. Not so our vibrating drum head. One



AGITATION OF POWDER DURING CONTINUOUS ROLE



FORMATIONS OF POWDER WITH SKIN AT REST

We have seen that by the act of striking the skin at a certain spot a sound-wave is created that travels down the shell, impinges on the shell, is deflected to the other side of the shell, and deflected yet again to the skin at a point opposite its starting place. This sets the whole skin in vibration in an even and regular series of pulsations. The first experiment has shown that it can only become a regular even pulsation if the skin responds to the same frequency (i.e. tension) at every radial point from its centre, or nodal point. If it does not do so, although the fundamental note will be there, it will be of short duration — followed, *before the wave dies*, by other sounds of slightly varying frequencies, i.e. a false note. Particularly is it absolutely essential to have the 'unison' of the beating spot and its immediate 'opposite' as carefully tuned to each other as two unisons of a trichord piano wire. When we have accepted the proven fact that this opposite responds *first*, and can only respond sympathetically to the same absolute sound, how simple all this seems! The next two opposites are obviously important, but only of secondary importance.

Think of a head as a clock-face. Six o'clock is our beating spot, twelve o'clock is our first opposite. At points three o'clock and nine o'clock effort, of course, must be made to produce unisons that are not only perfect, but that are each equal to six o'clock and twelve o'clock. The same, of course, at, say, two o'clock and eight o'clock, and so on. But this would be Utopia! Not one head in a baker's dozen will do this, so some compromises must be accepted and adopted.

Strangely enough, it seems that the area left and right of the front key, our playing spot, is the least important. By the time the sound-wave has reached here, we have usually started another on its journey. Players will remember countless incidents of being most dissatisfied with

the falseness and indefiniteness of some slow, measured beat. Think of that nightmare of perfect tuning and tone colour, the opening of Beethoven's Violin Concerto. And yet why is it that those few bars, if played at a faster speed, in conjunction with others, and with orchestral texture around them, sound perfectly good and quite in tune? After all, it is only a D, and we play D perhaps more often than any other note.

The reason for failure, of course, is firstly that the note is *alone*. Secondly, if it is fundamentally in tune, the falseness of subsequent frequencies, *after the note is struck*, are audible before the next note is played. So that in this unbelievably difficult first bar, one is striving after perfection. The D must first of all be in tune with the orchestra (and in one's own conception of this). Then it must be entirely in unison with itself, at least at six or even eight points around the circumference of the drum. And finally it must produce — as it will, if one is lucky enough to have succeeded so far — a beautifully heard harmonic of a fifth above. Small wonder that a celebrated conductor once said to me: 'When you can play this, you will be a good timpanist.' At that time I thought I was, but I have learned since how right he was!

2

The Path of the Sound-Wave—The Playing Region—Shape of Shell

THUS far, we have attempted to find the place in the skin where true tone may be expected. We now have to find the position, or distance from the rim of the shell, that will convey the sound-wave in the direction necessary for our objective.

To state, as do textbooks, tutors (and we ourselves), that this is *about* one-eighth of the diameter from the rim, is the 'ounce of practice' again, which is vague and unsatisfactory. We accept the dictum that a sound-wave will travel straight until it meets an obstacle, when it is deflected at an angle similar to that which it strikes. In other words, it follows a line of least resistance, from its inception (the striking of the head) until its return to the opposite. It is logical to assume, therefore, that a wave with the least number of deflections is best calculated to be a true one. Now I think it will be admitted that the average player strikes where it 'seems right' either to the ear, to the 'feel' of the stick, or (less commendably) where it is easier to play; and again I think this point is considerably less than one-eighth of the diameter. This is certainly so in drums of the floating-head and countersunk-rim types, where the rim is pulled down lower than the surface of the skin. Here I have observed players striking sometimes at as

short a distance as one and a half to two inches from the edge. In such cases it is they who are plotting the course of their sound-wave, oblivious of the fact that on its short journey it may have many deflections. Should we accept, therefore, a sound-wave decided by a player's choice of beating spot, or a beating spot demanded by a sound-wave that follows its best and shortest route? This factor is due not so much to the diameter as to the shape, depth, and contour of the shell, as is proved by the following diagrams in which an analysis is made of the good and bad points of various types of shells in common use today.

1. *American Spherical Bowl*

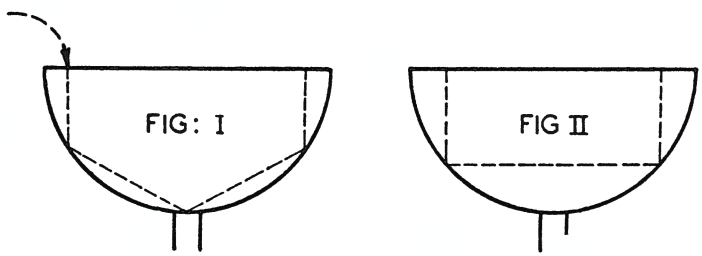
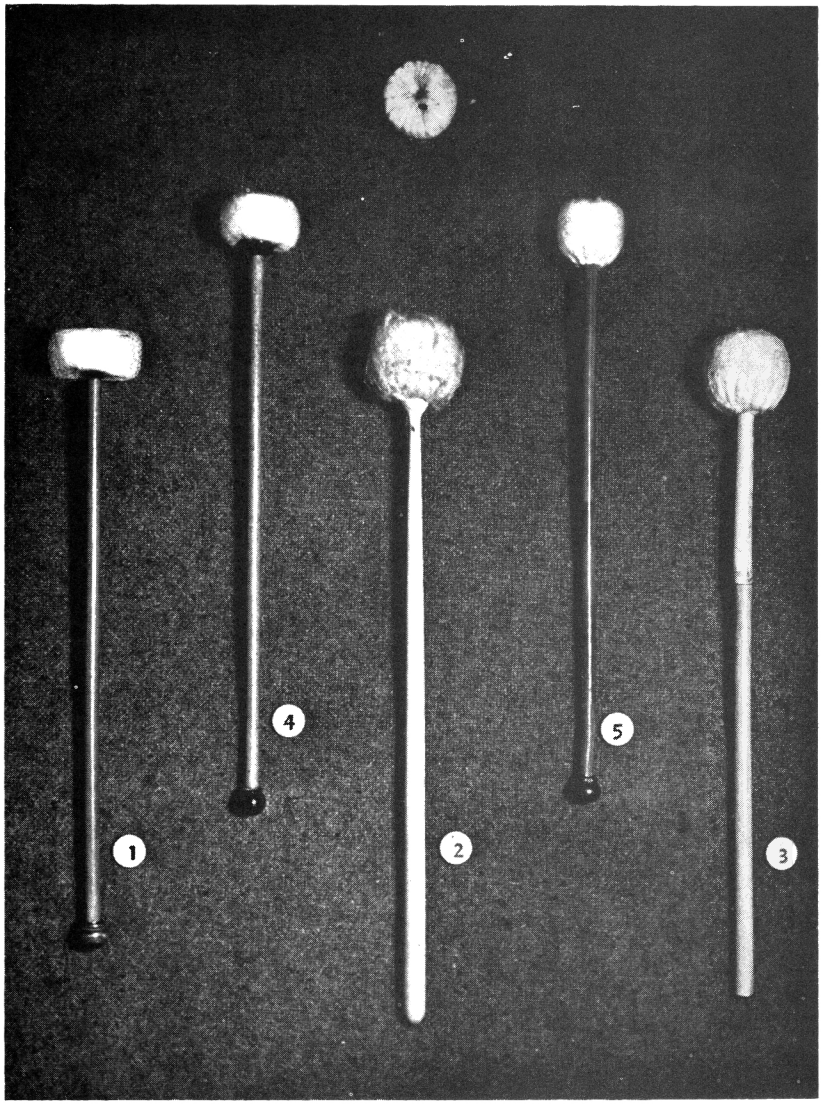


Fig. I shows the sound-wave as plotted by a careless playing spot, approximately two to two and a half inches from the rim. Observe the deflections! It is doubtful if the final one would finish at the 'opposite'. The second deflection would in all probability foul the sliding legs, or cables of a pedal drum.

Fig. II shows the same shell, with a rational sound-wave. This demands a playing spot quite three to three and a half inches from the rim. A rather short note is produced, with little resonance, but it should be excellent on high notes.



VARIOUS DESIGNS OF TIMPANI STICKS

3

Skins—their Treatment and Method of Manufacture—Conclusion as to Beating Spot

IN a previous chapter much mention has been made of the beating or playing spot. Too much importance cannot be attached to this, and because I differ from many players and even eminent investigators in my opinions on this question, it is necessary to justify my preferences and my beliefs. To do so we must trace the history of the skin from the time it leaves the animal, and even before.

A calf is slaughtered for its skin before it is twelve months old. The texture of its skin is affected by its feeding; over this we have no control. At such an early age the skin should not be cut, scarred, or damaged too much. Those that are so damaged, possibly by barbed wire or similar accidents while the young calf was alive, are graded as second-class skins; only those of good texture, of sound grain and free from holes are accepted for preparation for timpani heads. These are salted on the flesh side to preserve the skin.

They are then put through pits containing milk of lime (a suspension of slaked lime in water), which loosens the hair. This is then removed by pushing the hairy side of the skin over a curved beam with a tool known in the trade as an 'unhairing knife'.

To our modern machine-minded age the whole process

with its large soft felt, really accomplishes this. Rather there would seem to develop a fog of ugly sound that blots out the orchestral texture — that is, if it is really loud enough. If it is not loud enough, it can be nothing more than an anaemic rumble.

3 THE CONTINENTAL TYPE

Yet another stick of continental design merits comment. This is, I believe, mostly used in Germany and Austria. It is a very ordinary, almost amateurish-looking length of stiff bamboo, with a joint or two along its length. (It has not seemed necessary to choose a piece without this joint.) There is no ferrule or knob either for appearance or finger comfort. It has a fairly tightly stretched ball of felt of about one and three-quarters to two inches in diameter, sometimes flattened at its top. Owing to the pith or centre substance of the cane being porous, it is extremely light, and quite pleasing tones can be produced. It might be said that this is a typical Mozart stick. Certainly I can think of nothing better for any symphony or concerto by this composer. The demands Mozart made upon the timpanist were very slight, or very kind. Merely accuracy, softness of tone, a willingness to give way, good intonation, in other words, being 'a perfect gentleman'. These sticks are admirable for all this.

They are designed for, and no doubt are satisfactory with, the German model timpani. In this connection it is curious to note that many of our Teutonic colleagues prefer a fairly thick, all-white, opaque head. It seems to me that these demand a stiff, fast roll, and it may well be that these sticks assist them to achieve it. The same complacency or satisfaction with this stick is not felt if one thinks of Tschaikovsky or Sibelius, with their constantly changing moods, tunings, and dynamics.

4 THE HAWKES PROFESSOR MODEL (1908–28)

Here we had (I regret to have to use the past tense) a stick which I consider to be the best *commercial* one made. It is unfortunate that Messrs Hawkes (now Boosey & Hawkes) do not see their way to make and market this model again, for, with slight improvements, it would be a boon to English players.

It was beautifully balanced and fashioned from fine 'live' cane of varying thicknesses. It had bone fittings with, in those days, a long centre screw, now, of course, replaced with a bone screw-washer. The inner core was of hard piano-damper felt, covered with softer felt of similar material. The overall length was twelve and a half to thirteen and a half inches. The finished felt top was approximately one and a half by three-quarters of an inch. A really fine stick.

A fault which could be remedied was that, in my opinion, the diameter of the felt was too large in relation to its depth. The short 'shank' which took the felt did not allow of a deeper one being used by a discerning player; and the over-felt being stitched tightly top and bottom to the centre core constituted a fault I shall deal with in a later chapter.

Notwithstanding these minor disadvantages, this stick was widely used and favoured by the best players of the period just before, and for many years after, the First World War. These included Dix (who, I understand, made his own sticks completely), Henderson, Bender, Turner, Geldart, Rushforth — merely names to the present generation of players but great men in their day, who are remembered with admiration and affection by the older school of drummers.

6

Random Observations—Pedal Drums

THIS book commenced with the assertion that it was 'not a tutor'. I must be careful, therefore, in these final chapters to avoid remarks which might be construed as either a 'method' or an attempt to impart a particular technique of playing. These random observations, therefore, are of a general character — points I have observed in the course of a career of watching and listening, and which I think have a distinct bearing on tone and tuning. If tuning is the least difficult part of our art, and I firmly believe this is so, then let it 'appear' so.

The continual flipping with the finger, the leaning down to the drums, the turning and twisting and testing which have become an obsession with all too many players are rarely necessary, and always undesirable. They are distracting and annoying to conductor and audience. If one is fortunate enough to be playing continually upon the same set of drums, it is remarkable how accurate one can become at tuning without testing.

Another disagreeable habit, which is quite definitely cultivated, is the lifting of the sticks to exaggerated heights after striking. It is a desirable thing to come quickly away from the drum, but quite an absurdity to see the stick momentarily disappear behind the performer's head. A satisfactory and logical criterion might