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Publisher: Routledge
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Number: 1072954 Registered office: Mortimer House, 37-41
Mortimer Street, London W1T 3JH, UK

Proceedings of the Musical Association

Publication details, including
instructions for authors and
subscription information:
[http://www.tandfonline.com/loi/
rma18](http://www.tandfonline.com/loi/rma18)

The Double Bass

A. C. White

Published online: 28 Jan 2009.

To cite this article: A. C. White (1886) The Double Bass, Proceedings
of the Musical Association, 13:1, 99-112, DOI: [10.1093/jrma/13.1.99](https://doi.org/10.1093/jrma/13.1.99)

To link to this article: <http://dx.doi.org/10.1093/jrma/13.1.99>

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APRIL 4, 1887.

MR. W. H. CUMMINGS

IN THE CHAIR.

THE DOUBLE BASS.

BY A. C. WHITE.

Mr. STEPHENS.—Before the paper is read, I wish to make a few observations on the discussion which ensued on the very interesting paper which was read at the last meeting. On that occasion Mr. Whomes challenged the audience, and I accepted the challenge, to name the key of every piece that he played, the pianoforte being concealed from us. I put down on paper, and read afterwards, the key of every piece which he played, as they appeared to me at least, and the Chairman, who had sat at the pianoforte, came afterwards to the table and read out the key in which he had seen Mr. Whomes play. In every case the key in which Mr. Whomes had played on the pianoforte was a semitone higher than the one I had named. Now I am very anxious that any impression should be removed that I had been guilty of a failure on that occasion. It was simply that Mr. Whomes had, for the special purpose of his lecture, caused the pianoforte to be tuned a semitone lower; consequently, I was right in every instance, and Mr. Whomes has kindly come here on this occasion to corroborate what I say, and acknowledge that, for the purpose of his lecture, he was obliged to practise what, applied to my own particular case, would appear a deception, and he will acknowledge, I believe, that I was right in every instance as regards the true pitch, and when a selection from a Concerto of Beethoven in C minor was played, I said, not in C minor, but in B minor, and so it proved. After several of the audience were gone away, we compared the pianoforte with another one in the room, and found it was exactly what I have said, half a tone below pitch; therefore, whatever the position may be with regard to tone colourists, I wish to claim that I was in every instance correct in my judgment as to the key which was played.

Mr. G. A. OSBORNE.—As the Chairman on that occasion, I wish to say that every one who was present, I think, were

all perfectly persuaded before they left the room that Mr. Stephens was right.

Mr. WHOMES.—I think Mr. Osborne and everyone in the room knew that Mr. Stephens would have been right had the pianoforte been tuned to concert-pitch, and the fact of his naming the key a semitone below every time proves most conclusively that he has the gift of pitch. That everyone failed in naming the key in which I played on the piano proves, I think, that key colour has no existence whatever.

The CHAIRMAN.—I think we need say no more about this, except, although I was not present, I can answer for this, that there is no man living who has a more accurate sense of pitch than Mr. Stephens. I will now call on Mr. White to read his paper on "The Double Bass."

WHEN I was first asked to read a paper on the double bass, I hesitated, thinking I could not possibly make it sufficiently interesting; but as I was informed that there had never before been a paper read on the subject, I consented to do it, trusting to your kind indulgence of my shortcomings. It is not my intention in this lecture to attempt to describe the history of stringed instruments, as that can be read by anyone interested in the subject in a very elaborate work written by Mr. G. Hart. All I need say is, that bowed instruments were in a very primitive form and shape up to the sixteenth century, and that the great Italian maker, Gasparo da Salò (who lived in 1550), was the first to raise the manufacture of bowed instruments from a rude state to an art.

We read that even the ancient Hebrews had some sort of a stringed instrument, a viol, which they used to sound with the scratch of a horse-tail bow; and the fiddle which Nero played upon while Rome was burning must have been a very different instrument to anything we should call by that name now. Mr Hart says that Gasparo da Salò and Magini made many grand double basses; these instruments formed the stepping stone to Italian violin making, for they were in use long before the first era of the violin, and the number of basses at that time, compared with the violins, was ten to one, a fact which goes far to prove that the bass was the principal instrument then, and that the violin, which we all naturally look upon as the most important of stringed instruments, is only the great grandchild of the double bass.

The double bass is, as you are aware, the largest of stringed instruments, producing sounds an octave lower than those written, so that when the cello and bass play together, as they usually do, the effect produced is the same as when a passage is played in octaves on the piano. Sir George Grove, in his Dictionary of Music, says—in reference

to the double bass—"If the violin is the so-called leader of the orchestra, the double bass is its foundation; to it is given the lowest part on which both harmony and melody rest."

All this can be read in books, but, as an exponent of the double bass as played at the present time, I will now proceed to tell you what I have gained by my own study of the instrument.

The various methods of tuning and stringing the double bass have ever been a great drawback to this instrument; undoubtedly it was originally mounted with three strings only (as was the violin), but now the violin, viola, and violoncello have four strings, and are invariably tuned in fifths; not so with the double bass, for we find a different method of tuning in almost every country. In Italy, as in England, we formerly used three strings tuned in fourths, A, D, G. In France they tuned G, D, A, in fifths. In Germany they have four strings tuned in fourths, E, A, D, G. This is a very good system, because the scale lies under the hand without any need of shifting the position.

The French tuning in fifths, G, D, A, necessitates shifting at every scale. The Italian and English systems were the same as the German, minus the low E; basses with three strings have undoubtedly more brilliancy, but now-a-days the fourth string for orchestral playing has become a necessity, since modern composers very frequently write for the lower notes.

There was a very celebrated Italian double bass player named Dragonetti, who came to London in 1794, and died as recently as 1846, aged 91—and though it was before I came to London to join the musical profession, which I did in 1852, yet Mr. Howell, my master, who succeeded him as principal at the Opera, and whom I have since succeeded, used to tell me many stories about his wonderful performances on the double bass.

He was so hale and hearty almost up to the time of his death, that at the age of 90 he headed the basses at the Beethoven Festival at Bonn. I was told he tried various ways of tuning and stringing his basses; he even tried five strings at one time. He was a wonderful executant, and in the orchestra he always tuned his three-stringed bass in fourths, with A for his lowest note; and that remained for many years the standard system in England. It had its drawbacks, because we always had to invert the low passages and play them an octave higher, which produced a different effect from that intended by the composer.

I was among the first to tune my A string to G, gaining something by that; but as time went on, and we had so much modern German and French music to play—Berlioz, Wagner, Brahms, and others following in their wake—I found

it necessary to alter my system in order to fulfil my engagement at the Richter Concerts and add an additional string; and now that I have done so, I like it very much and find it very effective at times. But when I got a German strung bass to see what I could do on it, I found that the strings were so close together that when I played with any force, they rattled and produced anything but musical sounds. I therefore consulted Boullangier, the excellent instrument maker in Frith Street, Soho, and he carried out my wishes to the full extent, and I think that the result is in every way satisfactory; the bridge I had made very much broader, so that the distances between the strings should be the same as they were on the three-stringed bass, giving plenty of room for vibration; the neck I had necessarily made larger in proportion. I can therefore play with as much force on my four strings as I could on three. When I had added the fourth string, I found that E was not deep enough, as frequently in Beethoven's symphonies we find passages written down to E $\flat$, as in the Eroica Symphony, and in the Choral Symphony to double D often; again, in the Pastorale Symphony, we find even double C, this being the lowest note on the violoncello. I imagine Beethoven left it to the basses to do the best they could with it, and all they could do was to invert the passage and play it an octave higher. As this was the only instance I know of where the double C was required, I decided to make D my lowest note, and, when the C was wanted, to let the string down; but it is not very necessary, as it only occurs two or three times in the whole Symphony—in the slow movement and towards the end of the *Finale*. Mendelssohn, in "St. Paul" and "Elijah," has frequently written down to double D. Thus my bass stands tuned DD, GG, D, G; the double D being a very fine note, having the vibration of its octave in addition to its own sound. Since I have adopted this manner of tuning, I am glad to be able to say that many of our English bass players have followed my example, and I believe in a few years three-stringed basses will be as rare in orchestras as four-stringed ones were formerly. Mr. Manns at the Crystal Palace, and some other conductors, prefer to have in their orchestras a mixture of three and four stringed basses. Often I find a curious conglomeration of basses strung and tuned in various ways. I cannot think this is good. Other conductors stipulate for four strings only, irrespective of how they are tuned. My idea is that all the basses should be tuned in the same manner as the violin, viola, and violoncello invariably are. I think it would be a good thing if we could have a conference of double bass players and composers to decide which is the best manner of tuning, as music written for one system does not suit any other, hence

the paucity of music written for this instrument. I have myself just published a solo on the German air known as "Im tiefen Keller," but unless the bass is tuned as I use it, it could not be played except with great difficulty and without effect. Another drawback to the study of the bass is the great expense of providing an instrument, and then when you have got it, you cannot carry it about with you, and it involves much expense in portage or cab hire. A good enough violin might be had for a few pounds, but you cannot get even a second or third rate bass under at least £10 or £15, and if a better class of instrument is required £40 or £50 has to be paid.

I have four basses constantly in use at different places, and I had to borrow this fine bass (a Montagnana) to bring here to-day, as my others were all otherwise engaged. I know of two fine basses at the present time lying idle at the Royal Academy of Music; these instruments would be improved by being used, they do not wear out like pianos, but improve by use and age; there they are on the top of a cupboard at the Academy. Now if the owner of these basses would allow them to be used, he would confer a great boon upon us, and would encourage students to learn to play upon them.

Formerly the double bass was a most popular instrument amongst amateurs; the late Duke of Leinster, Sir Frederick Halliday, Canon Rowden, and many others used to play upon it, and double basses were at a premium. Now-a-days there is very little sale for them. Mr. Howell's beautiful Panormo bass (which during his life-time he valued at £300) was sold some time ago for £68. Dragonetti was offered £800 for his Gasparo (his favourite instrument), and he refused it; but I hope we shall again see the day when basses may be more appreciated than they are at present.

Independent passages for the double bass were unknown until the nineteenth century, with rare exceptions; but Haydn and Beethoven (who, by-the-by, played the bass for his own amusement) wrote for it independently.

Another point to which I should like to call your attention is the shape of our bows. In most countries they use a straight bow, resembling a violoncello bow, though shorter, and held in the same way. The one we use is called the Dragonetti bow; originally the arch was very much greater than it is at present, but Dragonetti improved it before the end of his career, and as he left it so we use it and consider it perfect.

Some think that the freedom of the wrist is impaired by holding the bow as we do, but I beg to differ from them. The action of the wrist is as free whether in the downward or sideways movement, and the advantage I claim for our bow is the greater amount of force procurable for the *fortissimo*

passages. This percussion attack cannot be and is not so forcible with the straight bow. Bottesini, the famous artist and double bass player, who has been playing solos on this instrument all over the world, and in London quite recently, plays on a smaller instrument than we do, and uses a bow similar to this one (a straight bow), and tunes each string a note higher, in order to obtain more brilliancy in the harmonics, which are very brilliant on the double bass. I consider it a lesson to any musician—vocalist or instrumentalist—to hear Bottesini play, his style, execution, and phrasing being perfection. I should advise anyone who has not heard Bottesini perform to take the first opportunity of doing so. I do not think Dragonetti could ever have played in the delicate manner of Bottesini—the former went in more for volume of tone.

The double bass as a solo instrument is rarely heard, and yet in the hands of a skilful performer it is capable of producing most pleasing and sympathetic tones.

I played a solo at Hereford a short time ago, by request of the Philharmonic Society there, and such a thing had never before been heard in that city. The audience at first seemed inclined to laugh (they usually do) at the ponderous sounds, and the gymnastics that I went through, but when I arrived at the slow movement they began to feel it was not intended as a comic performance.

Dragonetti with the bass, and Lindley, his companion for many years, with the cello, used to delight their audiences with their accompaniments to the recitatives in the oratorios and operas—now a thing of the past, for since Sir M. Costa died, and the Sacred Harmonic Society passed into other hands, the recitatives are accompanied on the organ in oratorios, and with a quartet of strings at the opera.

In the former case the organ is so far from the singer that they are seldom together, and for my own part I think when the recitatives were well done on the violoncello and bass the effect was much pleasanter to listen to. There are, however, various opinions on the subject.

I understand that when Beethoven's Choral Symphony was first performed at the Philharmonic Society in London, Dragonetti played the recitative and presto in the last movement *alone*.

I do not know whether the other basses were unequal to it, but now all the basses play it, or try to do so, so we have advanced since those days. I wish, however, that bass players would not think, as so many do, that they require no instruction to enable them to play in an orchestra. Many that I see do not know how to hold the bass, how to finger, or how to draw the bow across the strings properly, so as to produce pure tone.

Five-and-twenty years ago Sir M. Costa prided himself on having in his orchestra some of the finest instruments in the world, and players to match, and as they all (with one exception) tuned their basses in the same manner, the effect was marvellously powerful and grand; now-a-days I have seen in orchestras basses played on which might have been made by a village carpenter, and not worth thirty shillings.

Since Madame Néruda made it fashionable for ladies to play stringed instruments, several ladies have had even the courage to try their hand at the double bass, and the remarks I previously made apply equally to them.

I am a Professor at the Royal Academy of Music and the Royal College of Music and at several minor institutions, and at the present time I have not a single pupil at either or any of them.

Considering the bass is the foundation on which the fabric of a composition is built, it is a pity more young men with strong muscles do not study this grand instrument. It has a healthy developing power, expands the chest, and strengthens the muscles of the arm, and as a proof of the longevity of bass players, we have Dragonetti playing up to and over ninety, and at the present time I can name two octogenarians still playing away, and, as far as I am concerned, I have never had a day's illness since I joined the profession, thirty six years ago, notwithstanding the late hours, vitiated atmosphere, cold draughts, and exposure to the cold after the intense heat of the rooms and opera houses in which we work.

I will now tell you an anecdote of the great double bass player, Dragonetti:—At the age of eighteen he succeeded Berini as primo basso in the orchestra of the chapel belonging to the Monastery of San Marco, Venice. The procurators of the Monastery, wishing to show their high appreciation of his worth, presented the youthful player with a magnificent contra bass by Gasparo da Salò, which had been made expressly for the convent of St. Peter by the famous Brescian maker.

Upon an eventful night the inmates of the Monastery retired to rest, when they were awakened by deep rumbling and surging sounds; unable to find repose while these noises rent the air, they decided to visit the chapel, and the nearer they got to it, the louder the sounds became; regarding each other with looks of mingled fear and curiosity, they reached the chapel, opened the door, and there stood the innocent cause of their fright, Dominico Dragonetti, immersed in the performance of some gigantic passage of a range extending from the nut to the bridge, on his newly-acquired Gasparo.

The monks stood regarding the youthful performer in

amazement, possibly mistaking him for a second appearance of the original of Tartini's "Sonata del Diavolo," his satanic majesty having substituted the contra bass for his violin.

Upon this instrument Dragonetti played at his chief concert engagements, and though frequently importuned to sell it by his numerous admirers, declined to do so, refusing most tempting offers for his treasure. In his youthful days he decided that his cherished Gasparo should return to the place from whence he obtained it—the Monastery of San Marco—and this wish was accordingly fulfilled by his executors in the year 1846. It was felt by Dragonetti's friends and admirers that to consign the instrument on which he had so often astonished and delighted them with the magic tones he drew from it to the care of those who possibly knew nothing of its merits was matter for regret. ("The Violin," by G. Hart.)

I was anxious to get all the information I could respecting the instrument I was about to lecture upon. I wrote to my old friend, Mr. Charles Severn (one of the octogenarian bass players I spoke about just now). As I knew he had played for many years in the same orchestra with Dragonetti, I thought probably he would be able to give me some information respecting this subject. The letter arrived too late for me to add to my Paper, but as it contains information about Dragonetti, with your permission I will read it to you :—

"361, LIVERPOOL ROAD,

"*March 30, 1887.*

"DEAR MR WHITE,—I do not know how I can assist you in the double bass enquiry, but as you no doubt have ascertained everything in connection with the early history of the instrument, I can only supplement this with what I remember of Dragonetti. Dragonetti had experimented all through his long life in improving and perfecting the capabilities of the instrument. He had tried four strings, and he had at last settled down to three strings, as they were at his death.

"He used to lower the A to G occasionally, and in the case of 'Softly sighs,' from the 'Freischütz,' he went down to—

for the first two movements.

"The solo you refer to was in the Choral Symphony, and it produced a marvellous effect. Mr. Cipriani Potter told me he once played Beethoven's Sonata (violin) in F, with him—

when he played the violin part in harmonics, the same pitch as the violin; but these notes were produced in the lower part of the finger-board, as we play ordinarily, so that he must have produced notes two octaves higher than the stopped notes.

"This secret has died with him. Mr. Potter had written several pieces for him, which he showed me at the time. It would be interesting to find these pieces; perhaps Mr. Potter, the Society's eminent physician, his son, could find these things.

"Old Dragonetti was celebrated for his rushing up to a note like this—

on all parts of the instrument, producing an effect like thunder. Old Lindley, the celebrated cello, told me he played fifty-five years from the same desk with Dragonetti, and, in fact, Dragonetti used to lead the orchestra, for there was no conductor in those days. I am afraid I have given you very little information.

"I will conclude by saying that you remind me more than anyone of the manner of old Dragonetti.

"Your command of the four-stringed bass is most admirable, for hitherto the manner of playing the German bass is of a 'drawling character'—no dash—no attack; you manage it with great power of effect, and the attack is perfect, and as I said before, brings to my recollection the best points of old Dragonetti. I say all this *senza complimenti*, and in all truth and frankness.

"I am, yours sincerely,

"CHARLES SEVERN.

"I am very well, I have just begun eighty-one years of age."

The illustrations by the lecturer consisted of the following pieces:—Romance in E, B. Tours; Etude Mélodique, G. Bottesini; Old German Air, "Im tiefen Keller" (with variations), A. C. White; and the celebrated solo composed by Dragonetti (edited by A. C. White).

DISCUSSION.

The CHAIRMAN.—Our first duty, and a very pleasant one it is, is to accord Mr. White our sincere thanks not only for his paper, but for the examples he has played to us. At the same time, I am sure I should only be representing the

general feeling when I say I deeply regret the circumstances which have prevented Mrs. White being here. It now remains to invite remarks from any of the members present on the very interesting paper we have heard. I would say one thing myself with regard to the history of the instrument. Mr. White commenced by informing us that the double bass was the parent of all modern orchestral string instruments, the viola and violin. No doubt it was so, and remains to a certain extent in that position. In many monasteries abroad they still accompany the music only with double basses, sometimes supplemented by a small organ, but frequently only the double bass amongst voices. We had something akin to that in the way in which music was taught until a very recent period. All students were taught in harmony to construct the bass part before the melody; now-a-days, when we have so many ballads, we rarely get a good bass to the harmony, it is only melody that will set to a barrel-organ that is produced; but certainly, up to a very recent period, down to the time of Purcell, it was not so. He says distinctly in one of his books he wrote for Playford: "Formerly they used to compose from the bass, but modern authors compose to the treble, when they make counterpoint or basses to tunes or songs." He was the first man to point out that melody was a very important thing, but that the ancients did not make melody, because their basses were always melodious, at least they endeavoured to make them so. Another thing struck me just now, when Mr. White was showing the bow and the use of the bow, and especially the Dragonetti bow, it struck me that form was adopted, not probably for its better shape or convenience, but they had not at that time found out the way of managing the worm and screw. In all portraits of string players, down to a very late period, the violins were played with a bow not quite as much bent as this, but of this kind; they had no nut for screwing up the hair, but were obliged to tighten the hair by pushing the finger through underneath. That clearly was the reason why the bow was made in that shape. When they came to make the nut and screw, so that the hair could be tightened, there was no longer any need for the performers to push their fingers down, which must have been an extreme inconvenience, to tighten the hair. That is an impression which I arrived at from studying the old painters. You will find the great player of the viol de Gamba, Abel, is depicted in that fashion, pushing the hair out with his finger. Another matter touched upon was the recitative accompaniment. It is not quite the fact that the practice of accompanying the recitative by the organ or quartet of strings was introduced since Costa's time, because he himself did it. In "*Judas Maccabæus*" he had the reci-

tatives accompanied with a string quartet. He did not do so in all the oratorios, but when he came to write an oratorio himself, "Eli" or "Naaman," he took care not to write for the bass and cello solo. I think that shows that he felt the time had come when some change was needed. I would say that we had got accustomed to the solo bass, as it was performed in the early days when Dragonetti and Lindley played it, although I cannot say I know much about them, though I have seen them, and even later than that, when we had very excellent violoncello players, who were accustomed to play Handel, it probably went very well indeed; they studied harmony, and knew how to put the harmonies in; but when we got gentlemen from over the water, who do not know anything about Handel, and they came to play Handel on the cello, they do not know very much about harmony, the effect has not been so agreeable. I remember some years ago, at the Birmingham Festival, after a performance, when we had had one of Handel's oratorios accompanied with cellos, Theodore Thomas, the American conductor, came out to have lunch with me, he said, with regard to recitatives, "Do you always accompany them in that way?" I said, "Yes, we did." He said, "By Jove, it is just like a Japanese Festival." As he was a great traveller, I could say nothing to that, I never heard a Japanese Festival and did not know what it was, but it struck me as very remarkable that he should make a statement like that. I will not detain you longer, as there are many musicians here capable probably of throwing some side lights on this interesting subject. We have seen very clearly what a noble instrument the double bass is in the hands of such a performer as Mr. White, and I hope his remarks will lead to some consensus of opinion amongst double bassists, who will come to the conclusion that his method of tuning is the best. I am quite sure of it myself. I do not know anyone who plays the instrument like Mr. White. When you want accent it is always there, when you want phrasing it is there, and true intonation. If he will take this matter in hand, and induce his brethren to follow his example, it will be to the great gain of art, and much to the advantage of our ears and comfort.

MR. MATTHEWS.—I do not know that I am entitled to speak, as I am only a visitor and an amateur double bass player, which is not much title to consideration, but I think something is to be said for the three-string system. There is no doubt in the old days the effect Mr. White alluded to, when all double basses had three strings, and were all tuned in the same way, was finer than any we have had since. I think Mr. White will agree with me.

MR. WHITE.—Certainly, but I think if they were all tuned

the same way that I tuned them, we should get the same effect.

Mr. MATTHEWS.—Then there is another point. The instrument, I believe, was constructed to carry a tone as low as *A*, or possibly *G*, but if you want to go down a fourth lower, you must have a larger vibrating table, you must have a larger instrument. Mr. White is an exceptional player, but even with his playing the tone of the fourth string was not to be compared with the tone of the other strings.

The CHAIRMAN.—The lower you go in sounds, the less comparable the sound will be. It is more difficult for the ear to detect it. For instance, the lowest note in an organ cannot be heard by some people at all, they only know that there is a rumbling sound.

Mr. MATTHEWS.—I will put it in another way. Probably most people here are pianists and organists, and they have had to play on a small cottage piano. You all know what the bass of a piano is, and you know what the bass of a chamber organ is like with that bourdon which officiates for everything; you cannot get the same effect. I think it is the same with the double bass, if you want a fourth lower you must have a larger instrument. The thing is not constructed to go down to that pitch; and I do not think it will ever be done satisfactorily; of course, Mr. White has a very exceptional tone, and it is hardly fair to compare the results he obtains; but if you mix up with orchestras very much, as I do, or in audiences to hear the effect of four-string double bass, I think there is very much to be said in favour of the old system. If we have a lower compass, we must have a larger instrument.

The CHAIRMAN.—As a matter of fact, most four-string basses are played with the modern German bow, and then you cannot get the tone.

Mr. MATTHEWS.—But even with the other bow the tone goes off, I think; it becomes very much a matter of personal equation. Mr. White, at present, is the only one almost who plays the bass tuned in that way; he has sufficient skill to bring out the tone, but, I contend, the result will never be satisfactory.

Mr. SOUTHGATE.—The tone always appears to be weaker on the fourth string, in proportion to the others; it has not the same power. Now some have the string covered with wire, does that make any difference?

Mr. WHITE.—The reason for having it covered with wire is that you may have a thinner string. You want a very much thicker gut string to produce the same depth of tone.

Mr. GATES.—Does covering with wire make any difference in the tone?

Mr. WHITE.—I do not think it makes much difference, except that it may be easier to play.

Mr. STEPHENS.—I think it is not to be visited as a reproach to the lowest notes that they do not come with the same definiteness. With regard to the organ, the 32-ft pipe is not only a slow stop, but it never can be made so definite—you cannot get so much attack, the sound is not so precise or hard, as it is higher in the scale. Therefore, the remark that the lower notes have not the same effect of attack as those more within the ordinary range of compass is not against the instrument going down so low as that. I do not think it would be possible to get the low *E* on the double bass sounded with the same definiteness and point of attack as the *G* a tenth above.

Mr. WHITE.—Our ears require some time to take it in.

Mr. STEPHENS.—Sometimes, in listening to a 32-ft. tone, even with my faculty of pitch, I find a difficulty in determining it unless I hear the octave. It is not a reproach against the instrument which produces it, but against the gravity of the sound. As you rise in the scale, so the vibrations increase exactly two to one for every successive octave, and the more vibrations, the more definite and the more piercing the note.

The CHAIRMAN.—It is quite clear that a good deal of what is supposed to be the indefiniteness, or want of attack, comes from the finiteness of our hearing. It is with the ear, like the eyesight, movement may be so rapid that the eye cannot perceive it. Again with the lower notes, to a certain point you can hear the note distinctly, but if we get much below that we are not able to say what the note is at all without the octave above being sounded along with it—we are all agreed on this. So with the higher instruments, the flute or violin, the harmonics might go so high at last that we would defy anyone to say what the real note was, although it would be there. I think the fact which has been mentioned, that the lower note has not the same attack, and is not quite so definite, comes from the fact that our hearing is not quite so acute as that of some other people. But in orchestral works it is quite clear that that low *D* is of the very utmost importance, for to have a passage inverted and turned upside down, making a sort of harlequinade in the middle of a symphony, is very absurd, and the *D* is wanted very frequently. But I do think with Mr. Matthews that it should be specially studied; probably it needs a wide bridge, such as Mr. White has got, and possibly also a little larger finger-board.

Mr. SOUTHGATE.—Did I understand Mr. White to say that there was an instance known of the Jews using a bow? I have not met with that statement before, and I should like to ask his authority for it.

Mr. WHITE.—I read it in Mr. Hart's book, "*The Early History of the Violin.*"

The CHAIRMAN.—There are instances of the bow being found in Egyptian works, and probably, if the Egyptians had it, the Hebrews would have it from them. It is a curious fact that although we say this is the grandfather and progenitor of all stringed instruments, I have no recollection, in any ancient Cathedral, of seeing any sculptured Cherubini playing double basses, although there are many with violins. There is another interesting point which Mr White did not touch upon, probably Mr. Hart's book does not go so far back as that. There is a much finer book than Hart's, by M. Vidal, a superb book on stringed instruments, in three volumes. There must have been a progenitor of the double bass, and that was a one-stringed instrument—a monochord—and such an instrument is still in existence in the Cathedral at Basle, which clearly was used in the service as a musical instrument; an instrument with one string, much longer than this.

Mr. SOUTHGATE.—At Ulm Cathedral, in Wurtemberg, I saw three or four of these monochords, and I asked the question whether they were used for the service, or what they were for; the answer was that they were used forty or fifty years ago to start the plain-song and support the voices of the singers.

The vote of thanks to Mr. White was then carried unanimously.

On the motion of Mr. G. A. Osborne, a similar compliment was paid to the Chairman.