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The Vocation

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FEBRUARY 5, 1883.

J. F. BRIDGE, Esq., Mus. Doc.,

IN THE CHAIR.

THE VOCALION.

THE HON. SECRETARY said he was very sorry to report that Mr. Baillie Hamilton was too seriously unwell to be able to appear before them that evening. Up to the last moment he had hoped to come, but was positively forbidden to do so by his medical attendant. Mr. Baillie Hamilton had, however, sent a Vocalion, and one of his assistants was present who might give some information. Mr. Higgs thought it would be desirable that the instrument should be heard before any discussion took place.

THE CHAIRMAN.—I think we should get on better if the instrument were heard, because to many of us it is comparatively new. I should like to have the opportunity of saying that I came this afternoon at considerable personal inconvenience, and had no idea of occupying the chair, and I am afraid I shall have to leave shortly, but as I had the opportunity of using Mr. Hamilton's instrument once or twice at the Abbey I thought it would look somewhat invidious if I absented myself. I should also be glad to give the result of what little experience I have had of it. So far as that experience goes, the instruments which we have used at the Abbey on two occasions have not been large. The tone was charming to me, though we never had any great variety; but I could never feel that the instruments that were sent to us would do to supply the place, as some people seemed to imagine, of an organ. I am sure that Mr. Hamilton does not claim that they should do so; but I think he does hope that they will occupy the place of an harmonium and instruments of a kindred nature. I think what he has been striving for, and what apparently he claims to have obtained, is more variety; certainly that is very desirable. I have seen some of the instruments he alludes to at his show-room in Cadogan Terrace, and there is certainly more to interest

one in some of the large instruments than in the small one here. I fancy though that the variety he gets in the large instruments is to some extent obtained by organ pipes. If there is any representative of Mr. Hamilton here, perhaps he will be able to tell us that.

MR. HAMILTON'S REPRESENTATIVE.—He does get the top notes with pipes, but he is doing away with that now.

THE CHAIRMAN.—For the purpose that we required, the instruments that Mr. Hamilton sent were all that could be desired, and I should personally be very glad if the encouragement which he may get from its presence here and the presence of the members of the Association should enable him to bring it before the public. I do not know that I have anything more to say at present, but I should like to hear somebody play upon it.

The Vocalion was then played by one of Mr. Hamilton's representatives, who also exhibited several detached reeds having wires attached to them, and said: Mr. Hamilton has sent these reeds, and would have experimented with them to show that according to the different lengths of wires so different harmonics are produced from the reed; in getting the harmonics you kill the fundamental note, and, therefore, produce better and purer notes than by the free reed itself. He then proceeded to sound reeds of various patterns, and to illustrate the difference of tone obtained by shortening the wires attached to them. By cutting the wires different harmonics were produced.

MR. STEPHENS.—As a matter of fact, which is the first harmonic which is used—the octave?

MR. HAMILTON'S REPRESENTATIVE.—You can get the fifth below the reed. On the instrument which is sent here there are two reeds to every note braced together.

PROFESSOR W. GRYLLS ADAMS.—I am very sorry that Mr. Baillie Hamilton is not able to be here to-day to explain the action of the Vocalion. From the time when I heard Mr. Hamilton's first instrument some years ago, at a meeting of the Physical Society, I have been very much interested in it, more especially because of its relation to the instrument of Sir Charles Wheatstone, which I brought to the notice of this Association some years since. By placing a stretched string in the path of a current of air from a bellows which was blown by a pedal, Sir Charles Wheatstone produced a series of musical notes, and so combined the strings with the size of the pipes as to make them harmonise. The instrument which he made embraced one complete octave, but the tones were not as melodious as could be wished. Mr. Baillie Hamilton has made very great improvements in the tones of the instrument, by combining the reed loaded with wire with the current of air in such a way as to subdue

the harsh tones of the reed. I had hoped to hear from him what principle has guided him in his arrangement of reeds and wires, and it is difficult to explain them when one has not had the opportunity of seeing or hearing the instrument. The practice seems to be first of all to load a reed with a long wire which is too long to vibrate in unison with the reed, or with any of its harmonics, then to cut off the ends of this wire until the reed and wire harmonise well together. Then again cutting off other lengths, the proper length being previously determined so as to reinforce strongly any particular harmonic of the reed and make that more prominent than the rest, the quality of the note is entirely changed. By cutting off the proper lengths of wire you may reinforce any desired note, and so to the same reed you may give different qualities by means of wires of different lengths. The reed will give out the fundamental, which is somewhat harsh and is not reinforced, and will also give several harmonics, and the lower the fundamental, the greater will be the number of harmonics which it will be possible to bring out strongly. The shorter the wires the higher the pitch of the note which is reinforced. How well Mr. Hamilton has succeeded in improving the quality of the tones of his instrument, by introducing this variety of quality and shutting out, as it were, the harsh lower notes of the reed, will be evident from the beautiful mellow tones which were just now heard. These tones are very much more pleasing to the ear than the tones of Sir Charles Wheatstone's instrument.

MR. BLAKELY.—I know nothing about this particular instrument, but I think Professor Adams has set forth what appears to be the leading features of the reed combination with the wire. The reed in itself has, of course, a certain definite pitch and certain harmonics, but loaded with that cradle and wire it becomes a compound arrangement of a totally different fundamental pitch. We do not hear which harmonic arising from that compound Mr. Hamilton chooses as a matter of ordinary practice. I take it that the lowest note of the compound reed and wire is not used at all, but that the harmonic, re-enforced by the wire, is so powerful as to be used in fact as the fundamental note; for instance, if we want C we may get it from F, the twelfth below. Perhaps we might have a little more information on that point.

MR. HAMILTON'S REPRESENTATIVE.—The harmonic is always used considerably above the fundamental note. Taking the eight-feet C you get the harmonic four-feet from it.

MR. PROUT.—I should like to ask Dr. Bridge, as he has had an opportunity of playing the instrument at Westminster Abbey, what his experience was with regard to its carrying power at a distance. As far as my own experience goes,

I know no more than anybody in this room, perhaps not so much as many of you, of this modification of the reed instrument; but I have had a great deal to do with harmoniums, and my experience of the free reed tone is that it does not carry in a large place. I remember giving a recital on the harmonium and pianoforte at the London Institution, Finsbury, and I asked some friends in the room how the combination sounded. My experience was this, that those who were sitting near the platform, in the *forte* passages, could hardly hear the piano, but only the harmonium, and that was my own experience; I could not hear what the pianist was doing at all, but had to take it on faith. On the other hand, the people who were sitting at the farther end of the hall said, with the full power of the harmonium on, they could scarcely hear anything except the piano. The tone of the harmonium does not carry because, I believe, those small reeds set such a small quantity of air in vibration that there is not sufficient force in those vibrations to diffuse themselves throughout a large building; just in the same way, I suppose, if you drop a small pebble into a pond, you will not get anything like such a large circle or series of rings as if you drop a brick in. I should imagine it is very much the same principle; as a matter of fact, the harmonium tone does not carry to any great distance. I should like to ask Dr. Bridge how he found the Vocalion—whether there was the same defect, or whether the alterations which Mr. Baillie Hamilton introduced got over this difficulty to any extent.

The CHAIRMAN.—I do not know that I can give much information on that point, for two reasons. The first time it was used was in conjunction with the orchestra, only in a minor capacity, and I was conducting, so that I am unable to say how it sounded down the Abbey. The second occasion was one when I was more than ordinarily interested, and I do not know that I was quite capable of giving so much attention to it as I ought to have done, but I can only say it admirably fulfilled the duties it had to do.

The HON. SECRETARY.—On the first of the two occasions to which Dr. Bridge referred, I heard the instrument in Westminster Abbey, standing by the south cloister door, and I thought it was very effective from that point. I have a letter from Mr. Curwen which describes the effect of the instrument as played in St. Giles's Cathedral, Edinburgh.

GLASGOW, Feb. 3.

DEAR MR. HIGGS,—My absence from home will prevent me from being at the Musical Association on Monday, but you may be interested to hear my experience of the Vocalion at St. Giles's Cathedral, Edinburgh, last Sunday morning.

Sitting at the back of the church it really required close listening to distinguish its tone from the diapasons of a good organ. Upon

closer listening a greater roundness and lusciousness—if I may use the word—were manifest. The voluntaries, owing to the uniformity of colour, were monotonous.

The instrument was at its best in accompanying the voices. Its tone blended very well with the "clang-tint" of the voices—permeating, yet not obscuring, them. I must confess, however, that the flue stops of many organs that I know would yield almost exactly the same effect in a large building. This, at least, was my impression while listening to the Vocation at St. Giles's.

Believe me,

Very truly yours,

J. SPENCER CURWEN.

Dr. GLADSTONE.—I was present on both occasions when the instrument was played at Westminster Abbey, and, as I was not so deeply interested as Dr. Bridge, I might be better able to judge of the effect. My opinion is that the bass and treble were very much weaker in comparison with the middle parts of the instrument. I was sitting in the organ loft on the occasion of the performance of Dr. Bridge's *Mount Moriah*, and the greater part I heard very well, but there seemed very great weakness in the bass and treble. I noticed the same thing in Henry VII.'s Chapel, although I was much nearer the instrument. It seems to me the defect at present is that there is no bass.

Mr. FROST.—I may add my testimony to Dr. Gladstone's and Mr. Curwen's that the instrument is far more satisfactory in a large building than in this room, and I have been much surprised at the very feeble tone this has produced. When I attended the performance of Dr. Bridge's *Mount Moriah*, in Westminster Abbey, the effect was like a very satisfactory open diapason. It blended very well with the voices and produced a considerable body of tone, but it was much more satisfactory in the middle register than in the bass and treble.

Mr. SEDLEY TAYLOR.—Some years ago I had an opportunity, when at Canterbury, of seeing an instrument which was then being constructed by Mr. Baillie Hamilton, but I do not know whether or not he has introduced any changes in the construction since then. There were one or two points about the organ he was then constructing which struck me as remarkable. One thing was that the pitch of the note produced was independent of the intensity of the blast; you could diminish the blast until the sound died away, but it remained at exactly the same pitch, which is not the case in an ordinary organ pipe. Mr. Hamilton has taken advantage of that in this way—he had an arrangement, instead of the ordinary swell, by which you could add a little to the intensity of the wind by working a separate treadle, so that, instead of opening the swell box, you worked a treadle so as to slightly vary the pressure of the air. Of course you could produce in that way a more intense sound without any alteration of pitch.

Then there was another ingenious contrivance; this was an arrangement by which, pulling a stop half out you gained only half intensity, but by pulling it all out you obtained the full force of the stop. You could thus obtain different effects by combining the force of the stops, some fully drawn and some half drawn. You could thus get a great variety of tone, and, with three or four different stops, you might produce a large number of joint effects. Those were the main points in the instrument he then had. As regards carrying power, I only heard it in a private house, but I was very much struck by the fact that the sounds produced in these reeds were entirely unlike anything I had heard before; some, for instance, were exactly like a violoncello, and the effect was extremely like a string quartet. A friend of mine, who was outside the room, said he could hardly tell the difference between a string quartet and the sound produced by these stops. Dr. Stainer was down there the same day, and he cross-questioned Mr. Baillie Hamilton a great deal as to whether he could get a stopped diapason tone out of these things. He had not then a complete stop rigged up, but he had one note which produced a stopped diapason, and I recollect Dr. Stainer saying that if he had the rest as good as that he would be quite satisfied. He then used pipes but they were very much shorter than those used in the corresponding notes in an organ, so that great economy of cost would be obtained. I was very much struck with the tones; I do not say they were more beautiful than the organ, but they were evidently produced at very much less expense and were all produced from reeds, which I do not think had been done before.

[At this point Dr. Bridge had to leave, and the Chair was taken by Mr. Prout.]

MR. CHARLES STEPHENS.—I should hardly have imagined it possible that the instrument which has sent forth such a slender tone as this could really be productive of anything like the effect which has been described, in a large building. There is one point I should like very much to hear explained, and that is how the varieties of tone are to be obtained. Nothing has been said to indicate the possibility of obtaining a variety of tone, and that is one of the greatest essentials in an instrument of this kind. The prevailing defect alleged against this is that its effect is that of monotony, and, I think, while getting rid of the reedy quality of tone when we do not desire it, it would be well if we could have the power of retaining it when we do desire it. The reedy quality of the organ is among some of its most charming effects, and this might very well be retained in any instrument constructed in this form, with such modification as Mr. Baillie Hamilton has certainly made in the harmonium reed, which, to my mind, is

intensely disagreeable. Our second Chairman has informed us that he has had great experience with harmoniums. I am happy to say I have had very little. This promises to remedy some of the defects of that instrument, but, at the same time, we want greater variety than has yet been shown. Perhaps Professor Adams could supplement his remarks by saying something further on that point.

The CHAIRMAN.—Perhaps Mr. Hamilton's assistant could tell us how the different qualities of tone are produced.

Mr. HAMILTON'S REPRESENTATIVE.—You get the various qualities by different treatment of the reed; by curling the tongue up, or by bending it down, or by thinning it, you can get three good qualities of tone.

Mr. CHARLES STEPHENS.—There is something in the quality of tone which we call character, and it appears to me that you may change the intensity of reeds and yet, to a certain extent, retain the character. Everybody knows that the character of a flue stop in an organ is totally different to that of a reed, and it is precisely the variety of quality of tone produced which gives the greatest charm to the instrument.

Professor ADAMS.—With regard to the character of tone, I think I may say that from the very same reed you may get very different combinations, and so alter the character of the note produced. For instance, by cutting off different lengths of wire the reed will give out a totally different character, because a different harmonic is enforced; by bringing out one particular harmonic, and neglecting the rest, you thereby alter the character of the note, and that is what I think Mr. Baillie Hamilton does.

Mr. SEDLEY TAYLOR.—Is there a resonant air cavity connected with the reed?

Mr. HAMILTON'S REPRESENTATIVE.—There is no pipe connected with the reed; it has a double cavity.

Mr. SEDLEY TAYLOR.—Mr. Hamilton used to have a pipe in connection with it. The pipe would re-enforce some of the over-tones, and in that way alter the quality. If that pipe has been dispensed with, of course the explanation is no longer available.

The CHAIRMAN.—I may add, with reference to what Mr. Stephens has said, with regard to the difference in the quality of the tones of reeds, that I know, from harmonium makers, the very same reed may be made to produce two totally different qualities of tone, at least as far different as is possible with reeds at all, by reason of the different shape of the cavity from which the air passes to them. I possess at home one of Alexander's best instruments, and there are two stops, the flute and oboe, the quality of which are very nearly as different as they are in the two stops of that name in the organ, but the reeds are identically the same. If I were to

take one of the oboe reeds and put it over the cavity of the flute reed, transpose them in fact, the quality of the tone would not be altered; the difference is in the air cavity. That also has to be taken into account with regard to the difference in the quality of tone. I think Mr. Stephens has a very common prejudice with regard to the harmonium. I am not ashamed to say that I am very fond of the instrument, of which I have made an especial study. I am never surprised to hear people speak of it as Mr. Stephens has done. I believe the reason is that of every ten people who profess to play the harmonium nine do not understand anything about it. They make a terrible noise upon it, and imagine they are playing the harmonium, and so the instrument gets abused for what is in reality the fault of the players.

Mr. W. H. CUMMINGS.—I do not want to say much about harmoniums, except that I agree fully with Mr. Stephens. I have heard some of the best players on the harmonium, and have often wished I was absent instead of present. But I want to say something about Mr. Curwen's letter. He compares this instrument with the organ, and it seems to me that that is hardly fair. I think this is an instrument which I hope will entirely drive out the harmonium. But in listening to the instrument in St. Giles' Cathedral, it must not be forgotten that in Scotch churches they confine themselves to chorales, and they sing them at rather a slow pace; and there, undoubtedly, this instrument would be useful and would travel well; but I cannot imagine any one would be enthusiastic about it if they heard it in a church where they wanted to perform a full cathedral service, finishing up with Bach's fugue afterwards. Mr. Curwen also says it compares with the stopped diapason of organs. Now, it must not be forgotten there are very great differences in these stops so called. If you get a diapason of Father Smith's it is very different from a diapason made within perhaps the last 5 or 6, or even 50, years. At all events, the differences are so great that the stops are hardly alike; the name is common but the qualities are very various. It must not be forgotten, again, that in listening to these instruments in Canterbury Cathedral or Westminster Abbey that the place has had something to do probably with the charm that has been given to the tone. We know well that Westminster Abbey is such an exquisite place for sound that any continuous tone has really a beautiful and romantic effect. An instrument with a pleasant quality, played slowly, would produce a very fine effect; but I cannot help thinking that, with all the improvements which have been suggested, and no doubt there will be many, that these instruments are destined to take the place of the organ seems to me quite impossible. Certainly it is a grand improvement on the harmonium, and

in that respect I think it is very satisfactory; but on listening just now to this instrument it seemed to me to share a little in the defect of the harmonium when endeavouring to play in an organ way upon it with the chords in the right place; it is so thick and muffled that it is almost impossible to distinguish the flow of the harmony. That is the defect in the harmonium. If one listens to one of them it sounds like a quartet of vocalists trying to sing immediately after having had a very hearty dinner—it is very fluffy, and it seemed so just now. I do not know whether it may be in the performer, and I should be very glad if some of the good players present would kindly let us hear it again; but I could not clearly distinguish the four-part harmony.

Mr. G. A. OSBORNE.—I am happy to say that I am not a harmonium manufacturer, but still, Mr. Chairman, I think a few words must be said in favour of your argument. I have had the pleasure of hearing the harmonium exceedingly well played, and I am perfectly convinced that if some persons who have expressed these opinions about the harmonium had heard the sonata which you have composed for the pianoforte and the harmonium, where your knowledge of the instrument enabled you to bring out its beauties in combination with the pianoforte, they would have come to the conclusion that the harmonium is certainly a very charming instrument. It is a most annoying instrument, I admit, when badly played, which is nine times out of ten, at least, according to my experience.

Mr. SOUTHGATE.—I should like further to endorse the few words which have been said in favour of the harmonium. It was my good fortune to hear, in Paris, Lefebvre Wely play on it many times, and also the Chevalier Lemmens, and I must say the effects they got and the beautiful tone obtained was most charming. I also was greatly prejudiced against the instrument until I heard them, and then I altered my opinion. As Mr. Prout says, the harmonium requires a certain amount of study, and must be played in a proper way with a peculiar combination of chords. The way in which we play chords on the organ and pianoforte will not do with the harmonium. I will just mention that one of the peculiarities which Mr. Sedley Taylor mentioned in Mr. Baillie Hamilton's instrument, the invention which he saw at Canterbury, by which the power could be increased or diminished without altering the pitch, is exactly the principle on which all French harmoniums, and, I believe, the best English ones, are constructed; the vibrations of the two reeds are isochronous, and whatever pressure of wind you put on them you do not alter the quality of tone or of pitch, but simply the intensity of sound, and the provision which has been made to do that in the French harmoniums, the

expression stop, is the most valuable feature of the instrument, because it enables you to do with the harmonium what you cannot do with the organ or piano—you can get expression. The organ is an instrument without expression, and we can get accent, which on the organ cannot be done. That is simply done by using the expression stop. I do not suppose Mr. Baillie Hamilton claims that as an invention. With regard to allowing a small quantity of wind to go in and swell the tone, that also is the same as the sourdine stop. With regard to the reeds, it strikes me that Mr. Baillie Hamilton is on the right road to get a very perfect quality of tone which will satisfy even so good judges as Mr. Cummings and Mr. Stephens also. Helmholtz lays it down that the various qualities of tone of different instruments are produced simply by the admixture of over-tones or harmonics. The difference, in fact, between the tones of a violin, a clarinet, and other instruments, although they may play the same note, arises simply from the presence in certain combinations of particular harmonics, one giving off some harmonics which the others do not. If, by means of controlling these reeds and getting rid of or increasing or intensifying certain harmonics, we can get a purer quality of tone without any of the disagreeable over-tones which are so conspicuous in the harmonium, no doubt the invention would be very valuable, and I think the whole musical world would welcome it.

MR. W. H. CUMMINGS.—That you may not suppose I spoke without some acquaintance with the instrument, I may say that I travelled for some six weeks with the Chevalier Lemmens and he played every night. I fell in love with his playing, but not with the harmonium.

MR. CHARLES STEPHENS.—I think that among the defects of the harmonium, or rather of its players, has been that they have not endeavoured to study the thing as an instrument *per se*, having its own characteristics. It is a great fault of some organ players that they try to play pianoforte music on the organ, and *vice versa*. I think I may venture to say that I have heard some players on the harmonium whom I could not do otherwise than admire, but the mistake is to try to convert it into an organ. I suppose even a Jew's harp may be susceptible of a pleasing effect, but it cannot be made to play pianoforte music.

THE CHAIRMAN.—I was on the point of saying that I think the great mistake of many harmonium players is to try to make it into an organ. Mr. Cummings, when he spoke first, said he had heard organ music played upon it, and it sounded so thick you could not hear the four parts. My answer would be, do not play organ music upon it, play music especially adapted to it. If you will play organ music upon it you will

have the most dreadful noise. I should no more think of playing organ music upon it than I should think of attempting to play one of Bach's violin sonatas.

Rev. THOMAS HELMORE.—Perhaps it may not be amiss to remind the meeting that even the organ itself with unskilful players produces a very unpleasant effect. If you attempt to bring together sounds which are too near to one another you hear those over-tones which are so objectionable. I have always found the harmonium very disagreeable if you play full chords close together, but when the harmony is much dispersed you get a better effect; it is not so painful. I quite agree that the harmonium is often played most disagreeably.

Mr. SEDLEY TAYLOR.—There are one or two acoustic principles in connection with the harmonium which incapacitate it for playing close harmony. When two tones are played close together they give rise to combination tones which do not agree, and that is a difficulty which cannot be got over by the best playing in the world.

Mr. CHARLES STEPHENS.—I never heard any instrument give so many resultant tones as the harmonium. The difficulty is, if you play it with the whole pressure on you cannot play any two notes without a resultant tone.

Major CRAWFORD.—As Mr. Stephens has introduced the Jew's harp, I may mention that that was made a solo instrument some years ago with great effect, and I believe the Rev. Mr. Helmore heard it as well as myself; Mr. Eulenstein used to play two Jew's harps at the same time in harmony with great effect.

Mr. CHARLES STEPHENS.—Mr. Chairman, we met here to-day to hear Mr. Baillie Hamilton, who has often interested us very much indeed, and I do not think we ought to separate without passing a vote of condolence with him in the misfortune which prevents his being here to-day. He has made every effort to be here, and up to the last moment entertained the hope that he might be able to come, but it has been utterly impossible. I, therefore, beg to move, "That this meeting offers its sincere sympathy with Mr. Baillie Hamilton, and regrets the illness which prevents his being present, and also presents its thanks to him for his kindness in sending the instrument and apparatus to illustrate the subject."

Professor ADAMS.—I have great pleasure in seconding the proposal.

The Chairman put the resolution, which was carried unanimously.

The usual vote of thanks was proposed and carried to Dr. Bridge and Mr. Prout for presiding.
