

On a Pair of Ancient Egyptian Double-Flutes

by Thomas Lea Southgate (1836-1917)

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NOVEMBER II, 1890.

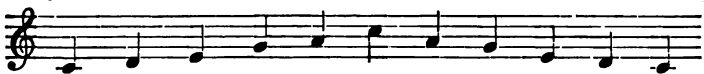
SIR JOHN STAINER, M.A., MUS. DOC.,
PRESIDENT OF THE ASSOCIATION,
IN THE CHAIR.

*ON A PAIR OF ANCIENT EGYPTIAN DOUBLE-
FLUTES.*

BY T. L. SOUTHGATE.

IN the spring of the present year I received a letter from Mr. Flinders Petrie, who was then in Egypt, telling me of a great find he had come across while excavating in the Fayoum. The letter was partly in answer to one I had written him, begging him to look out for any traces of a musical notation that might possibly have been employed by the ancient Egyptians. I was then engaged in a study of the rise and history of the notation of music. I thought that in Egypt—the mother of civilisation, that wonderful land which has done so much in the way of discovery and development of the arts and sciences—it was quite possible that the art of writing down sounds sung by the voice, or given forth by instruments of music, might have originated; and that the Greeks might have borrowed the idea, as they borrowed and adopted so much, so very many of the arts and customs of this most ancient people. Mr. Flinders Petrie told me that as yet a method of music notation had never been looked for, but that he would keep his eyes open, and should not be surprised, now that its possibility had been suggested, if some such system were to be found in the papyri dealing with religious services, or on the wall-paintings of tombs, where distinguished musicians were buried. And he went on to say he had found in the coffin of a mummy, buried more than 3,000 years ago, a case containing a pair of double-flutes, still in perfect condition, despite the ages and ages that had elapsed since they were buried with their long dead owner. He told me one of these pipes possessed four finger holes, the other three, and he gave me the dimensions of the tubes; roughly each are about eighteen inches long and three-sixteenths of an inch diameter, and he furnished me with the distance of the holes from one another. The singularly small size of the bore surprised me, and I opined that Mr. Petrie had erred in these measurements, for I felt that such slender tubes as these would not have spoken as flutes. The importance of the discovery was very great from a musical point of view; indeed, its significance can hardly be overrated, for I saw that these pipes

would most likely supply what had been a matter of speculation for ages past, and is still a mystery—viz., the notes or exact sounds of the old Egyptian scale. I will not detain you by recounting the many guesses by historians and investigators as to how this ladder of sounds was built up, and what was the musical system the Egyptians employed. It is enough to state that it has been generally assumed to resemble the mode now in use in Egypt, a country where very little change occurs; and where they employ a system of quarter tones, third of a tone, and such minute intervals as are used by the Arabs, Persians, Hindoos, and other Eastern people, a system we, with our Western trained ears, cannot appreciate, and which we somewhat hastily (I venture to think) conclude can be nothing more than a fortuitous collection of intervals, possibly fit for a melodic purpose, but one impossible to deal with, so far as harmonic combinations are concerned. The late Carl Engel, in his valuable work "The Music of the most Ancient Nations," argued with much ingenuity that the Egyptians, in common with the Assyrians and the Hebrews, used the Pentatonic scale—



that is to say, our modern diatonic scale less the fourth and the seventh. In this scale there are no semitones, and of course no chromatic intervals are employed. Some few writers have hazarded a guess that Pythagoras obtained the idea of his so-called tetrachordal system from the Egyptians, and thus the music of the Greeks came from an African source. Remembering all this, I was naturally anxious to see these precious flutes so wonderfully preserved, and impatiently waited for the time when Mr. Petrie would bring the results of his excavation labours to London. I do not propose to speak to you on the music of the ancient Egyptians. The subject is a fascinating one, but I must not stay to describe their various instruments of the string, wind, and percussion types—there are as many as seventeen different kinds of these known to have been employed; nor will I dilate on their music itself, or on their performances. Those who have given any attention, or studied all this, cannot but feel that the music of the Egyptians must have been of a higher and more complete kind than that which obtained among the Greeks, even in their palmiest days. The Greek writers indulge in much hyperbole as to the wonderful effects of their music; the papyri of the Egyptians are silent in this respect. But better than such descriptions, fanciful or real, the Egyptian artists made use of their brushes to such good effect, that in the frescoes which adorn their sumptuous tombs we have pictured for our instruction the

daily life of this people, their arts and customs, as they existed two, three, four, and five thousand years ago. These monuments speak a language that cannot be misunderstood : together with their papyri they tell us enough to perceive that a high degree of civilisation and culture existed on the banks of the Nile, when the inhabitants of this island were—well, probably cannibals. So far as music is concerned, we have plenty of evidence proving that the ancient Egyptians were highly susceptible to the art. They employed it to increase the mysteries of their religious worship, to endow their warriors with courage, to minister to the delights of their social entertainments, to enhance the rhythmical effects of their dances, and to please the people in their ceremonies, festivities, official celebrations, and public processions.

I am aware that before Mr. Petrie's discovery some few Egyptian flutes and portions of others of different kinds have been found ; there are some such at Turin, Paris, Leyden, Berlin, Florence, and in our own British Museum. But so far as my knowledge goes, they are isolated and incomplete examples ; and scattered in various museums are portions of many other old Egyptian instruments. Interesting, deeply interesting, as are these relics of music, so far as the music they once gave forth is concerned they tell us very little. The strings that once sounded, and the notes they played, are alike vanished ; even such representations as we possess of instruments of the lute tribe, with fretted finger-boards, cannot help us ; we know not how the strings were tuned, nor can we be sure that the painters depicted the frets in their proper and just positions. With a pipe that is intact, and still playable, we are in possession of evidence which cannot be gainsaid. Nature's laws of acoustics are the same to-day as of yore ; all we have to do is to find out the way the instrument was blown, and we must obtain precisely the same result as the Egyptians got three thousand or more years ago. There may remain some doubts as to the use of harmonic intervals, as to the pitch of reeds employed, or as to what clever performers could do by partially covering the finger holes ; but apart from these considerations, the main scalar features of wind instruments still perfect can be determined without difficulty.

Mr. Flinders Petrie brought his collection over to England in September last, and it was on show at 6, Oxford Mansions, until a fortnight ago. I must not touch on this most interesting exhibition. Some of its objects took us back to the dim stone age, for there was a sickle shown made from the jaw-bone of a camel, the teeth taken out and sharpened flints set in their places, constituting a reaping hook of immense antiquity. A papyrus of the time of Abraham was quite late compared to this. And below this, as it was hung on the wall, was an incubator used by this wonderful people

to hatch eggs artificially in much the same way as the last patented contrivance fulfils the same office with us. A large table in the back room contained on it the objects of such great interest to musicians. On this was deposited the spoils from the tomb of the Lady Maket: the chair on which she sat, her wooden head-rest, looking-glass, and paint-pots (for the face I mean); her combs, earrings, bracelets, necklets, rings, with her name engraved on them; scarab charms, beads for her fancy work, and a dozen other things that need not be mentioned. All these were taken out of the lady's coffin by Mr. Petrie himself: and, most precious of all to us musicians, a case of some umbelliferous plant containing the pair of double-flutes which are now before you. The burial of this lady took place in a rock-cut sepulchre at Kahun, a town built for the use of the workmen employed to construct the pyramid of Usertesens II., a monarch of the twelfth dynasty, who reigned some 4,300 years ago. Mr. Petrie is of opinion that about 1100 B.C. the tomb was rifled, and again used by some new-comers in search of a sepulchre for their family. From that period—about the time that Saul reigned in Israel—until this present year, the tomb had remained undisturbed. The chief person buried there was a lady whose name was engraved on a gold scarab and on a small silver one set in a ring. Thanks to the kindness of Mr. H. Martyn Kennard, who now owns this ancient seal, I can show you an impression taken from it.

The inscription runs:—



Neb-t pin Mak-t.

“Lady of the house Mak.”

It is thought that the Lady Maket may have been of Phœnician extraction, no doubt she was a person of some rank; it is sufficient for us to know that she must have been a musician, and so her beloved flutes were buried with her for use in the spirit world, according to the custom of her people. Had these slender pipes been placed loosely among the other articles in the coffin, the probability is they would long ago have fallen to pieces; but fortunately for us, they were carefully enclosed in the hollow case used by the lady in her lifetime, and so they have been preserved, and are yet playable.

I had expected to find pipes about the diameter of our concert flutes, and thought that the measurements Mr. Petrie had sent me from Egypt must be wrong. I believed what he had found were specimens of the long flute, held obliquely and sounded by being blown across the top, in just the same way as the modern “Náy” is played in Egypt. The name of this was the “Sébi,” the Greeks calling it *πλαγιαυλος*, the Romans *Tibia obliqua*. There are many drawings of

persons playing on this long side flute, and as the instruments vary in length, even in the same drawing, it must be certain to musicians that they were of different pitches, and so took their several respective parts in the great scale of sounds.* Small as was the diameter of these tiny flutes Mr. Petrie had found, he considered that, like the larger and longer ones, they spoke by lip blowing only; and I inclined to the same belief. But Mr. D. J. Blaikley, who joined us in the examination, was of opinion that the tubes were of far too small a bore to be sounded in this way, and that some form of reed must have been used with them. Mr. Petrie gave us, together with Mr. Hermann Smith, minute measurements, and from these *fac-similes* of the ancient pipes have been made. Mr. Blaikley constructed some of brass tube, agreeing in thickness with the slight walls of the reeds, and I made similar specimens in brass, cane, and paper. These being identical in their various measurements must of course give identical results; material does not affect the pitch or intervals, and indeed has but little to do with tone quality. Although by lip blowing the notes given by unclosing the various finger-holes can be distinctly heard, I found it impossible to make the pipes speak properly in this way, and some flute players to whom I applied, and who tried their skill, were equally unsuccessful. Still, I did not despair. Many persons cannot make an ordinary flute speak; very, very few can obtain notes from the Náý; and I know that in India a flute of a similar kind—viz., a simple hollow tube—is still employed, and is most difficult to play. Then there is the nose-flute of the Polynesians and Feejee Islanders; and further, there are open tubes played by the natives in Guinea and Brazil, but probably these are of a large bore. I suspect none of us would readily succeed in playing any of these. All such instruments require skill and practice to sound them. But despite much perseverance and consideration, I was unable to evoke any respectable sound from my copies of Lady Maket's instruments. I found that M. Loret, a French investigator, had also failed to get similar slender pipes to speak, and fell back on the reed of the oboe. I tried a flageolet whistle head, after the manner employed for very small organ pipes, but without success. I then turned attention to reeds, and, of course, found the tubes spoke readily with all sorts of reeds, whether beating, of the clarinet type, or double as the kind used in the oboe, or of the arghool form as are those employed for the drones of the bagpipes, excellent specimens of which were sent me by Mr. D. Glen, from Edinburgh. Best of all, were reeds cut from the stalks of wheat straw, one end being closed by a plug of wax, and a short vibrating tongue cut lengthways with a sharp

* There is one such in the museum at Florence, measuring 2 ft. 4 in. in length, and possessing five finger-holes (Subsequently described).

knife. The only difficulty was to pack these air-tight into the orifices of the tubes, for if this was not done properly the notes were uncertain and harmonics resulted. I was strengthened in the impression that reeds of this kind were used by finding amongst the Egyptian collection at the British Museum some fragments of pipes of a similar nature to the complete ones Mr. Petrie discovered; and with one of these was found a long wisp of oaten straw. It is probable that this was carried by the players to make fresh reeds as required for their flutes. I find that portions of similar Egyptian pipes are in the museums at Florence, Turin, Leyden, Berlin, and the Louvre. Most of these seem to have had three or four finger holes; some have their embouchures protected by waxed thread, or narrow bands of papyrus wound round. In the Leyden museum is a case which enclosed some fragments of pipes, together with three short stalks of straw. In the Turin collection is a flute with six holes, having a diameter of four millimetres only, and with this was found some straw; a short length is still stuck in the embouchure. More than this is hardly required to tell us how these old flutes were blown; but I came across a most valuable piece of evidence on turning over the pages of that magnificent work of Rosellini's, "*I Monumenti dell'Egitto.*" Plate ninety gives a representation—almost life-size—of a lady playing the double-flutes, accompanied by some others, clapping their hands to the dancing of two Nubian girls. You can see the original fresco in the British Museum; here is a copy of the flute player from it.



The pipes are blown exactly like those we have here tonight; about an inch before the inverted A-shape tubes enter the mouth, the brown pigment with which they are painted stops, and the rest of the tubes are white. Evidently this represents the two short straw reeds with which they were supplied, and furnishes a certain proof of how they were played.

The fresco comes from the famous Beni Hassan tombs; though dating from the periods of the eighteenth-nineteenth dynasty (1700—1400 B.C.) it is in good preservation and the colours of the painting are still distinct. The figure I show you forms one of a group of musicians engaged at a gentleman's house in connection with a festival in honour of the god Ptah. A number of guests, men and women, are seated on chairs, while women-servants are handing wine to them, female musicians sitting on the ground play to them, and women dance before them. Many of the guests hold a lotus flower, and one man a handkerchief, as a mark of refinement. In addition to the double-flute player, there are three girls marking the rhythm of the dance by clapping their hands; unfortunately the end of the fresco is wanting, so we cannot tell what instruments the other musicians in this little band were playing. In the middle of the fresco is an inscription in hieroglyphics, the commencement of which is wanting. Mr. H. W. Mengedocht has kindly translated this for me, and it runs:—

“ . . . odour Ptah, Seb hath made his glories to grow from every matrix, Ptah hath done this with his hands for the pleasure of his heart, the canals are full of water, the earth is renewed bathing in his love.”

The god Ptah is frequently mentioned in the Hymn to the Nile, Seb personifies the earth from which everything proceeds.

You will notice that in playing the hands are crossed, the right hand dealing with the pipe on the left side of the performer, and the left hand with the pipe on the right. This peculiarity is found in several other instances of the frescoes in the Egyptian tombs.

It is just possible that the straw stem employed by the players may have been flattened by splitting the top of it, the two sides then forming a sort of double-reed of the oboe type; but I have not succeeded in getting such straws to speak. I must not stay to recount the history of the double-pipes, or to quote from the classical authors what has been written about these favourite instruments of music; nor will I speculate on the music they played, or the part they took in the Egyptian orchestra. Pollux mentions them in his “*Onomasticon*.” In Gianelli's “*Dizionario della Musica*,” under “*Flauto*,” will be found a most interesting extract

from Manasio, describing the double-flutes and how they were played. The Egyptians called them "Màm," the Greeks termed them *Διαυλος*, and they were supposed to have come from Phœnicia and under the name "Gringroi" been used in playing the "Song of Linus"; the Latins called them *Tibia pares* when the pipes were of equal length, *impares* when one was longer than the other. The main interest these old pipes have for us is the exact sounds they produce. You shall see a table of the results of my experiments, giving the notes obtained—(1) By lip-blowing; (2), by using a tiny straw reed; and (3), by testing with a bagpipe small tenor reed. I have also set down the actual vibrations the notes yield, together with the vibrations of the corresponding notes according to the Philharmonic standard. You will afterwards hear the pipes, but we shall do little more than sound them after their long slumber; what they can do you will hear on the *fac-similes*, and I must ask your indulgence for Mr. J. Finn. Not only are they difficult to play, but we have not found out all the peculiarities of the reeds employed, which are sometimes uncertain, and go off, as reeds will.

But first I will show you some copies of Egyptian wall paintings, in which the right or direct flute (played as we blow the flageolet or clarinet), the open long oblique flutes, and the slender double-flutes are severally depicted. Those interested in the music of the ancient Egyptians will find further illustration of their instruments in Lepsius' great work "Denkmaler aus Ægypten," in Sir Gardner Wilkinson's valuable "The Manners and Customs of the Ancient Egyptians," and in Champollion's "Egypte." Then you will hear (if my reeds are obedient) Lady Maket's flutes, that have been silent for some 3,000 years; and afterwards Mr. Finn—to whom, as well as to Mr. Blaikley, I am indebted for much valuable help in investigating this interesting subject—will play on the *fac-simile* specimens we have, so that you can form some idea of what these instruments could do. Let me say that Mr. Carruthers, the chief of the Botanical department at South Kensington, has examined these flutes with great care, and pronounces them to be made of the water reed, "Arundo Donax," still growing near Cairo, and from which plant, under the name *Sativa*, we obtain the materials for our oboe and bassoon reeds. Thanks to Mr. Ware, of Tottenham, I can show you some stalks of this plant he cut and sent me.

I will not anticipate any discussion which may arise as to the scalar system these flutes and the specimens of the long oblique flutes reveal, further than by calling your attention to the fact that the scale employed is not the Eastern one of divisions of thirds and quarter tones, a method alien to our system; neither is it the pentatonic, for it

contains a perfect fourth to its fundamental sound. If I may say so much, it would seem that it includes the basis of our present system ; and when you hear what I have to say on the short shepherds' arghool double-flute, or rather chalumeau, an exact specimen of which will be played to you, you will perceive that the Egyptians possessed both a diatonic and a chromatic system, and you will probably form an opinion that our Western musical system came from the Egyptians, with whom Pythagoras stayed, studying their arts, customs, and history for some eighteen years. It would seem that all the Greek philosopher did was to classify and hand on the system of the Egyptians, which was current a thousand years before he was born ; he did not evolve a new one as his countryman pretended, and as many historians have too readily accepted.

Mr. Southgate here showed eight large outline drawings copied from frescoes in some of the Egyptian tombs. They represented girls playing the double-flute, and bands composed of performers playing on various stringed, wind, and instruments of percussion. The following are selected for representation here. A side view of a girl sitting on the ground playing the double-flutes, from a tomb at Thebes ; much of this fresco has fallen away :—



The next two examples are borrowed from illustrations to Stainer's "The Music of the Bible." This shows a player

on the double-flutes of the *tibia impares* kind ; one tube is longer than the other.



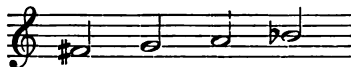
This represents a small band, consisting of three men sitting and clapping their hands, three girls standing and performing the same rhythmic office for the double-flute player, who is executing a dance as well.



Mr. Southgate then sounded the original pair of double-pipes.

The notes heard by lip blowing across the tops are, for the three-hole—

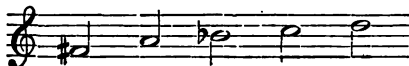
Corresponding to * B C D of the annexed plan.



The F sharp is the fundamental note of both the tubes.

On the four-hole—

Corresponding to * B C D E



Here is a reduced plan of the long double-pipe, the tubes being given separately; and underneath is the parallel "Zummárah"—to give it its modern name—together with its arghool reed. *A* represents the respective embouchures, the letters following are placed over the finger or vent holes.

Fig. 1.—The  shaped Double-pipe.

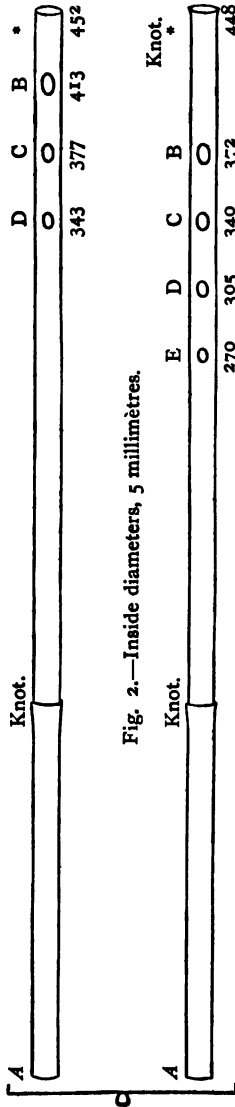


Fig. 2.—Inside diameters, 5 millimètres.

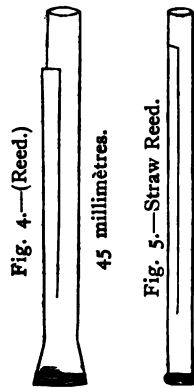


Fig. 4.—(Reed.)

45 millimètres.

Fig. 5.—Straw Reed.

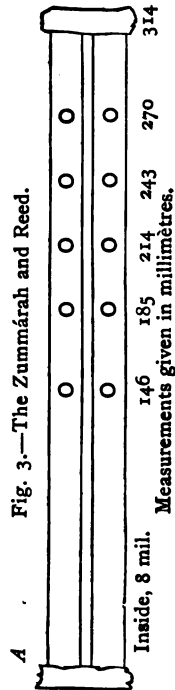
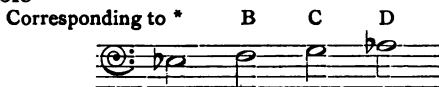


Fig. 3.—The Zummárah and Reed.

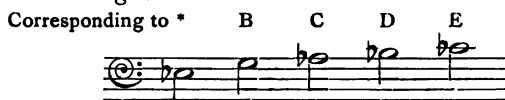
Inside, 8 mil.

Measurements given in millimètres.

It will be observed that one tube is a little longer than the other ; this is probably intended in order to compensate for the flattening effect of the knot which occurs just at the end of the shorter tube, thus contracting it. The measurements given show the distances of the various finger holes from the embouchures. The holes are elliptical, beautifully shaped, they range in length from six to three millimètres, and they gradually decrease in size for the higher intervals. The reed employed to sound them is given in Fig. 5, full size ; it is of the chalumeau or clarinet type—viz., a single beating reed, the end of the straw being closed with wax. Of course it obeyed the acoustic law, sending the true notes of the pipe down an octave lower and about one tone farther, to agree with the additional length the short piece of straw added to the tube. The notes now heard were for the three-hole—



The four-hole gave—



On employing a large bagpipe (arghool) reed, two-and-a-half inches long, the vibrating tongue being one inch, and which reed, away from the tube, sounded middle C, the pitch in both cases was carried down a minor third lower for all the notes. Small musette and oboe (double) reeds were tried, but the results were not reliable ; the holes, when uncovered by the fingers, often gave harmonics. The fact was, the reeds were too strong for the slender column of air to control, and so the reeds had the mastery, and did not synchronise with the mathematical length of air in vibration. Something of a similar nature occurs even with the little straw reed, for it will be observed that the first interval of the three-hole pipe by lip blowing is a semitone, whereas with the reed it is a tone ; and again with the four-hole, it is respectively a minor third as against a major third.

It will be perceived that the notes set down are the notes of our scale, though they do not proceed in the same order as we employ.

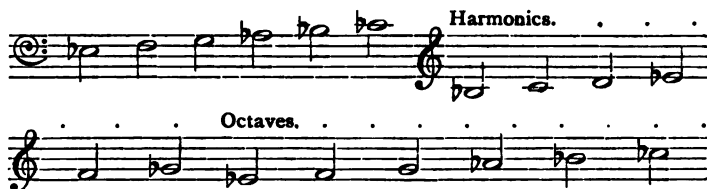
The following table will show how very nearly these notes approach the corrected intervals of our modern tempered scale—a scale, be it remembered, intended for harmonic, and not merely melodic purposes, and consequently not mathematically true. The first column gives the notes produced with the reeds the second the actual vibrations of the notes,

the third the Philharmonic scale, and the fourth (for comparison) the mean pitch of three of the modern bagpipe scales, all carefully noted by Mr. D. J. Blaikley:—

† E flat	160	160	160
* E flat	160	160	
* F	177	179	178
* G	197	201	196
† G	194	201	
* A flat	215	213	213
† A flat	213	213	
† B flat	233	239	231
† C flat	257	254	256

The notes on the three-hole tube are marked *; those on the four-hole †.

It may, perhaps, be assumed that the notes given above form an incomplete and truncated scale, but this is not so. The pipes and reeds are ruled by the same acoustic law which governs the production of the harmonic notes in our clarinet. Consequently it is quite easy, by varying the pressure of wind, to obtain their respective fifths (not the twelfths as is customary) and octaves. That being so, the complete series of sounds is as follows:—



Such is the series of notes readily obtainable from these pipes. Here is the Greek tetrachord, and something more; moreover, Mr. Finn, by varying the wind pressure, obtains from the three-hole pipe the complete diatonic scale of C. But over and beyond these notes, practised players can obtain other intervals by manipulating the vibrating reed with the tongue or lips, and by partially closing the finger-holes, and the Egyptians could have done just the same.

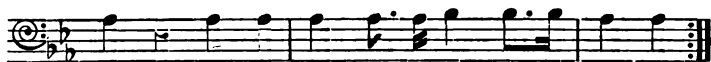
The question as to how the pipes were played is a speculative one. Both may have been sounded together, one forming a sort of drone bass; or two parts may possibly have been played, though this is not likely: or the reed of the one desired to be silenced may have been pressed against the side of the mouth, thereby stopping its vibrations and speech; or the player might have temporarily removed one pipe from the mouth, or drawn it forward to the lips, so as to stop the reed vibrating. In all probability the music played was slow, so that a practised player had time to make such alterations in the disposition of his pipes as were

required. The holes were, no doubt, stopped by the second joints of the fingers, not the first, as we now employ, and to make the notes it was not required to uncover all the holes, so that the hands kept a good command over the tubes.

As small specimens of music that could be rendered on the double-flutes, Mr. J. Finn played on the three-holed tube the following "Song of the Water Carriers," an ancient melody still in use in Upper Egypt:—



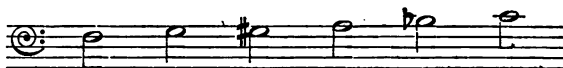
And on the four-hole tube the "Song of Linus," a melody of immense antiquity. It is mentioned by some of the earliest of the Greek classic writers as being played on the "gringroi"; it is occasionally still used as a dirge at funerals:—



It is of course uncertain whether these are the very notes used. As the notes of the pipes readily yield their fifths and octaves, in all probability these higher sounds were those selected for use by the ancient players. I have here a specimen of the Egyptian *Náy*, on which Mr. Finn will sound the notes by blowing across the edge and partly down the tube. It is the descendant of the ancient oblique flute, merely a hollow tube; no doubt it is the parent of our modern flute, the difference being that we stop up one end with a cork and blow through a small hole at the side.

As to the short pair of double-pipes fastened parallel together, I need detain you a few minutes only. Inasmuch as they are played with a beating reed, they belong to the old chalumeau or shepherd's pipe tribe of instruments. The example in the case here was found by Mr. Flinders Petrie in the Coptic cemetery at Gurob, in the Fayoum Province, and he assigns to it the date of 600 A.D. It should be remembered that this was before the conquest of the country by the Persians, and so the old tonality must still have obtained; after the conquerors had settled down, they impressed their arts and customs on the Egyptians, and from that time the Arab music, with its strange tonality and differently placed intervals, must have gradually supplanted the ancient system of the country. Even if the date assigned be later than the fifth century, the intervals obtained from this double-pipe cannot be of the Arab type. You will hear that

they consist of a series of six notes differing but little from our corresponding intervals:—



It is of special interest to know that in company with the double-pipe, Mr. Petrie also found one of the reeds, so we know just how this instrument was played. I have placed a piece of paper under the tongue in the glass case here, so that it may be more plainly seen; so elastic is it that it will still vibrate, but the pipes themselves will never sound more, they are hopelessly cracked. However, I have made a *fac-simile* from two short pieces of bamboo, and with a couple of reeds of the same character inserted, Mr. Finn will let you hear the tone of the instrument. Of course, we cannot tell if both pipes spoke identical notes, the holes being in the same position would lead one to suppose so; but if the tongues of the reeds employed or their tubes were of different lengths, the performer could play in thirds or sixths, or, indeed, in independent parts. Most likely they went together with a wave or quivering between the two tubes. I should observe that this trembling is the custom, and considered to be delightful among most Eastern nations; and so Egypt, from which so much good has come, is also the originator of that blemish of singers—chiefly of French and Italian origin—the detestable *tremolo*.

Mr. Finn will play to you on this shepherd's double-pipe an ancient piece of music still played at weddings among the Copts, the descendants of the ancient Egyptians:—

WEDDING MUSIC.

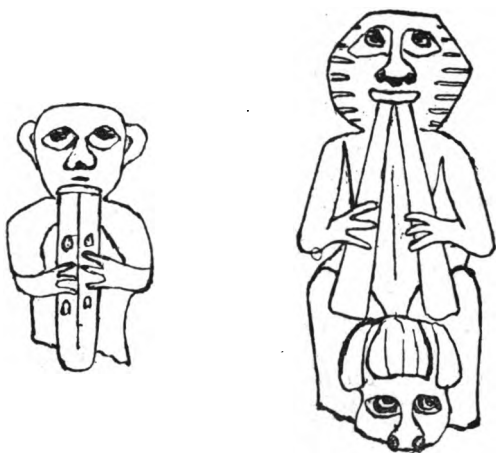


Fig. 3 shows this double-flute, and Fig. 4 its reed full size.

I cannot show you any drawings of players performing on this species of double-flutes, but Mr. Petrie and Mr. Hilton Price have been good enough to lend for exhibition four small figures showing a boy, the god Priapus, a woman, and a monkey playing the instrument. When I tell you that one of these is assigned to 2500 B.C., you will then be able to

form some idea of the immense age of the double-pipe; and remember, that before some genius thought of fastening two together, a single pipe must have existed for ages and ages previously.

Two of these have been selected for illustration here. One is a figure of a boy playing the double-pipes, it is covered with a beautiful dark blue glaze; this was found at Kahun, and is of the date 2500 B.C. The other is a grotesque figure of a monkey playing the pipes with the head of the god Nefertun between his knees; this comes from Memphis, and is about 800 B.C.



A form of this double-pipe—the Zammar—is still played commonly in Egypt and Syria; only in some cases the second tube (so to speak) has ceased to utter melody, and has been turned into a sort of drone bass; it is furnished with various lengths of tube in order to adapt its drone to the note required.

I should point out that the bagpipe is a pipe—I had almost said, musical instrument—of this description. It is still popular in certain parts both at home and abroad. We once had an ancient instrument of this nature, the "Pibcorn," about which and its congeners an interesting paper appeared in the November issue of the *Anthropological Journal*.

Let me remind you that the double-flageolet was used in the present century. I possess one by Bainbridge, in excellent order, and had it not been on show at the Military Exhibition I should have brought it for your inspection, as the last descendant of the very ancient Egyptian double-pipe, and some music should have been played to you on it.

Only, perhaps, after hearing all these double-flutes, ancient and modern (*fac-similes*), it is quite possible you might then have been tempted to repeat the sarcastic observation of old Cherubini, who, when asked, "What can be worse than a (*une*) flute?" contemptuously replied, "Two (*deux*)."

DISCUSSION.

On showing the drawings Mr. Southgate said: (1.) This is a drawing of the *Tibia recta*, the Greek *Μοναυλος*, and is a figure taken from a fresco at Thebes. (2.) This is a drawing of the long oblique flute, the *Sébi*. These flutes were played by being blown across the top by the lips. They are difficult to play in that way; one of them is in the museum at Florence, and there is one at the Louvre. (3.) That is the instrument, a specimen of which I believe we have here to-night, the old double-flute. It is taken from a rather large fresco, consisting of five women playing, some the harp, some double-pipes, while others are clapping their hands.

Sir J. STAINER.—Those pipes are not joined, are they?

Mr. SOUTHGATE.—No; they are two separate pipes, but are held in that inverted A-shaped position by the lips of the player.

Sir J. STAINER.—I can't understand why they should be called double-pipes if they are separate instruments.

Mr. SOUTHGATE.—They consisted of two independent tubes, but were played together. (4.) This represents a lady dancing, and also playing the pipes. (5.) This, I take it, is a priestess, also playing the double-pipes.

Dr. J. F. BRIDGE.—Surely some of the pipes at the Exhibition were joined?

Mr. SOUTHGATE.—Not of this kind, but of the shepherd's pipe type. (6.) This is from a very large fresco, and a most interesting one. Three girls are sitting together. One is playing the double-pipes, while the others are clapping hands. Others, again, are dancing. The subject is evidently descriptive of an entertainment being given at some nobleman's house. Nine guests, ladies and gentlemen, are sitting at a table with lotus flowers in vases, eating, drinking, and enjoying themselves. The drawing is curious from the fact that the hands of the player are crossed in such a way as to lead one to believe that the right hand is playing the left pipe, and the other the right pipe; this can hardly have been so.

The CHAIRMAN.—Unless it is meant to be a perspective. The intention may have been to depict the one flute a little in advance of the other.

Mr. SOUTHGATE.—(7.) This is a priest offering incense. Here we get a harpist; one performer is playing a long oblique flute, while another is playing on one still longer. (8.) Here is a performer with the lute, and another with a sistrum, and an ancient drum, now at Berlin.

Dr. A. C. MACKENZIE.—Were the notes sounded those given in the bass clef according to your table?

Mr. SOUTHGATE.—Yes; of course the pitch of the tube was altered by the length of the reed and its tongue; it became practically a “stopped” pipe.

Mr. STEPHENS.—I don’t quite follow your table of notes; before the insertion of the reed, one of the intervals was a semitone, while now it is a whole tone.

Dr. MACKENZIE.—Why should the third be altered in the reed pipe?

Mr. SOUTHGATE.—The answer is this. The column of air is so very small, having regard to the bore of the tube, that the reed is the chief controlling power; you must get a reed to be exactly in sympathy with the pipe, otherwise the absolute notes given out are uncertain. I should tell you that when the flutes were discovered, they were of rich orange colour. It is, however, customary to cover articles of wood found in the tombs with wax, in order to preserve them; hence their black appearance. I am sorry to say that this one had a little piece broken off at the end when Mr. Petrie exhibited it; it was actually done by the Curator of some museum! I have joined it together with shellac varnish, and it seems to go all right. Just observe how very beautifully and daintily these holes are made; so excellently graduated. I was talking to a flute-player about them, and his opinion was that the flutes must be forgeries, since he believed that graduating the size of the holes was only an invention of the present century!

The CHAIRMAN.—Is there any painting in which such very small flutes are shown?

Mr. SOUTHGATE.—There are many wall paintings in the Egyptian tombs, in which they are depicted, and they are often found represented on vases, gems, and in other ways.

Mr. CUMMINGS.—“Flute” is a generic term with the Egyptians. There is a particular way in which they were placed, according to the special ceremony that was being observed. If they were turned to the right, they meant one thing, and if to the left, another. There were many kinds. This slender double-flute is only one sort.

Dr. MACKENZIE.—I take it that the first lines of the tables show the notes produced without the reed.

Mr. SOUTHGATE.—Yes, by blowing across the top only.

Mr. BLAILEY.—As I had an opportunity of seeing these Egyptian flutes with Mr. Southgate at Mr. Petrie’s

exhibition, I may, perhaps, say one or two words from a careful examination of them. In the first place, there was some difficulty in making true *fac-similes*, owing to not having the originals for a sufficiently long time in hand to take accurate measurements, and the fear of injuring such fragile objects. The reeds vary in diameter, according to their natural growth, and in copying them I endeavoured to be as exact as possible under the circumstances. There may be a difference between the copies and the originals, though it is very slight. Although the reeds were taken in their rude, natural condition of irregular growth, we must not judge therefrom that the tuning was haphazard. Some persons I have spoken to on the subject were under the impression that the players of these pipes simply cut a few holes at random, and that, consequently, the tuning was haphazard. I don't think that this is the fact; I think the tuning was regulated. A question arose in my mind, when I first saw the pipes, and I put it to Mr. Petrie, whether they were not mere toys, or models, or something of that kind. He assured me that he had not the slightest reason to think so. According to his view, they were evidently articles that had been in actual use, and would be good of their kind at that period, as, in all probability, they were the personal possessions of the lady with whom they were buried.

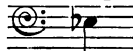
Mr. SOUTHGATE.—May I interrupt by stating that Mr. Petrie called attention to the fact that the holes were worn.

Mr. BLAICKLEY.—Then as to the method in which these flutes were played. Some are of opinion that this was done by blowing across the end, as with Pandean pipes; you may just hear the notes, when they are so obtained, but the sound is a mere murmur. Therefore, in my opinion, a reed of some kind must have been used, and the next point for solution is the kind of reed: it seems to me that a reed of the arghool type was most probably used. If we take a very light reed, it adapts itself to the length of the tube; that is to say, if you sound it first with a tube of a certain length, and then add a further length of tubing, the difference in pitch of the instrument, pipe and reed combined, will be the difference due simply to the added length of tubing. I tested that point very carefully, because everything in this enquiry depends upon it. If we use a stiff reed, we get any pitch we like, according to the reed; but if we use a very light and small reed, we can be tolerably sure that the notes we are getting are the notes due to the length of the tube as determined by the different finger holes. I first took a reed with a certain length of tubing, and then added a sufficient length to flatten the pitch a twelfth, and found that the flattening was exactly that due to the added tube. That result would apply to the tubes as varied in length by

the holes in the same way. Of course there will be little differences, according to the actual length of the reed, and to the extent it projects from the tube; but such a difference of pitch would influence the relative pitches very slightly indeed. Then with regard to the extremely small bore of these pipes, it might be mentioned that at the Military Exhibition, in the Loan Department, there was a racquette shown, seven inches long, with nine holes bored through a mass of ivory, and the bore of that racquette was very little more than that of the pipes under discussion. It was an instrument blown with a double reed, and sounded the low C of the bassoon, with a pipe something less than a quarter of an inch in diameter. With regard to the notes produced from my copies of the "flutes," as sounded with a small straw reed, I will write down a few figures:—

Harmonic Scale.		Egyptian "Flutes."		Highland Bagpipe Chanter.
Notes.	Vibrations.	With 3 Holes.	With 4 Holes.	Mean of 3 Observations.
9	Ratio 3 to 4. Perfect fourth. Ratio 5 to 6. Minor third.	160	160	160
10		177·8	177	178·8
11		195·5	197	196·3
12 5		213·3	215	213
13		231·1	...	233
6	256·0	...	257	*

* This last interval is a minor tone ratio, 9 to 10.

The note produced from the full length of each "flute" is $E\flat$  and the note speaking from the highest hole of the three-holed instrument is $A\flat$, a perfect fourth above this, the fourth being divided into three unequal tones, exactly in the same way as this interval is divided in the harmonic scale from the ninth to the twelfth notes. These are the natural notes of the horn or trumpet, from the high D to G. On the four-holed flute the second of these notes is missing, and the two higher holes give respectively a note corresponding to No. 13 on the harmonic scale, and a note a minor tone higher than this, or a minor third, ratio five to six, higher than the highest on the three-holed flute. The lowest and the highest notes of the two flutes therefore give the chord of $A\flat$ minor, which

may here be noted on the "moveable do" system, as well as with the vibrational values:—

E♭	A♭	C♯
160	213'3	256
mi	la	do

These three notes can, therefore, be written accurately in our notation; for the other notes our notation is only approximately correct, just as it is for the higher natural notes of the horn and trumpet.

The close correspondence of the scale of the three-holed flute with a portion of the bagpipe scale as reduced to the same pitch, is certainly worthy of observation in connection with the view that the bagpipe has possibly come to us from an Eastern source.

Hearty votes of thanks were passed to Mr. Flinders Petrie for the loan of the flutes, as also to Mr. Southgate for his paper, and to Mr. Blaikley for his valuable assistance in the matter.